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Introduction

4 minutes

You can design Microsoft Power BI reports in Power BI Desktop or Power BI service (web portal). Power BI mobile apps don't support report design; they support only the report consumer experience.

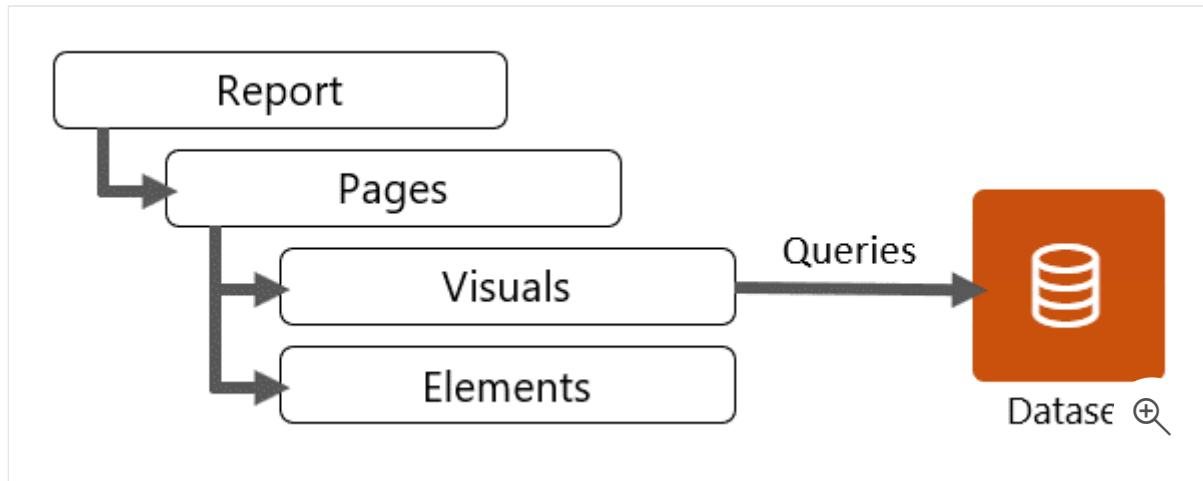
⚠ Note

Power BI Desktop is only supported on Windows operating systems. As a design tool, it also supports the development of reports and data models. In this module, the focus is only on report design.

Report structure

Structurally, a Power BI report connects to a single dataset (data model), and it has at least one report page. However, it's common that reports have multiple pages. On each page, *report objects* are laid out. Report objects include:

- **Visuals** - Visualizations of dataset data.
- **Elements** - Provide visual interest but don't use dataset data. Elements include text boxes, buttons, shapes, and images.



Report pages

Similar to Microsoft Excel worksheets, you can add, rename, resequence, hide, duplicate, or delete Power BI report pages.

Tip

Duplicating pages can help expedite report development, especially when you're copying a completed and polished report page. However, take care that you don't over complicate the report design if you can accomplish a duplicated page by filtering a single page. For example, instead of creating one page for each customer, you could use a slicer on a single page to filter by customer.

Report consumers navigate to a visible page by selecting a page tab (in Power BI Desktop) or by selecting the page in the **Pages** pane (in Power BI service).

The decision to create more pages depends on your report requirements. Strive for a report design that expresses the data in a logical flow on the page and between pages. A well-designed report often provides a high-level summary on the first page with supporting detail on the following pages.

Occasionally, it might make sense to have a single report with many pages. Other times, it could make sense to separate pages into different reports. This scenario is especially true when you design those pages for a different audience or when you need to secure, share, or distribute them differently. The reason is because reports are a security and publication unit, and report pages belong to reports and can't be secured or published independently of the report.

You can hide pages when they're not yet ready for use; they're a *work in progress*. However, you might commonly hide them because you want to control how they're accessed. You can provide report page navigation with buttons or by drilling through from a visual. It's also possible to design a page as a tooltip, which is revealed when a report consumer hovers over a visual.

You can configure various page-level settings, which can be set in the **Format** options. Commonly applied settings include page information, page size, and page background.

Next unit: Design the analytical report layout

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Design the analytical report layout

7 minutes

When report consumers look at a report, an automatic and unconscious process occurs when they comprehend what they see. Therefore, you should adhere to basic report design principles to support this process to help effectively communicate meaning from data.

⚠ Note

Report design is a blend of science and art, and many possible report designs are available that help achieve the audience and interface requirements. What matters most is that the report design effectively communicates the data to meet requirements.

An analytical report can consist of one or more pages, and pages comprise report objects. Report objects can be data visuals, which represent query results, or decorations like images, background shapes, or text. You can begin to design a report layout by determining the number, sequence, and purpose of the pages. Make sure that you avoid combining subjects or opposing objectives on the same page. Then, design each page layout with specific report objects that are relevant to the requirements.

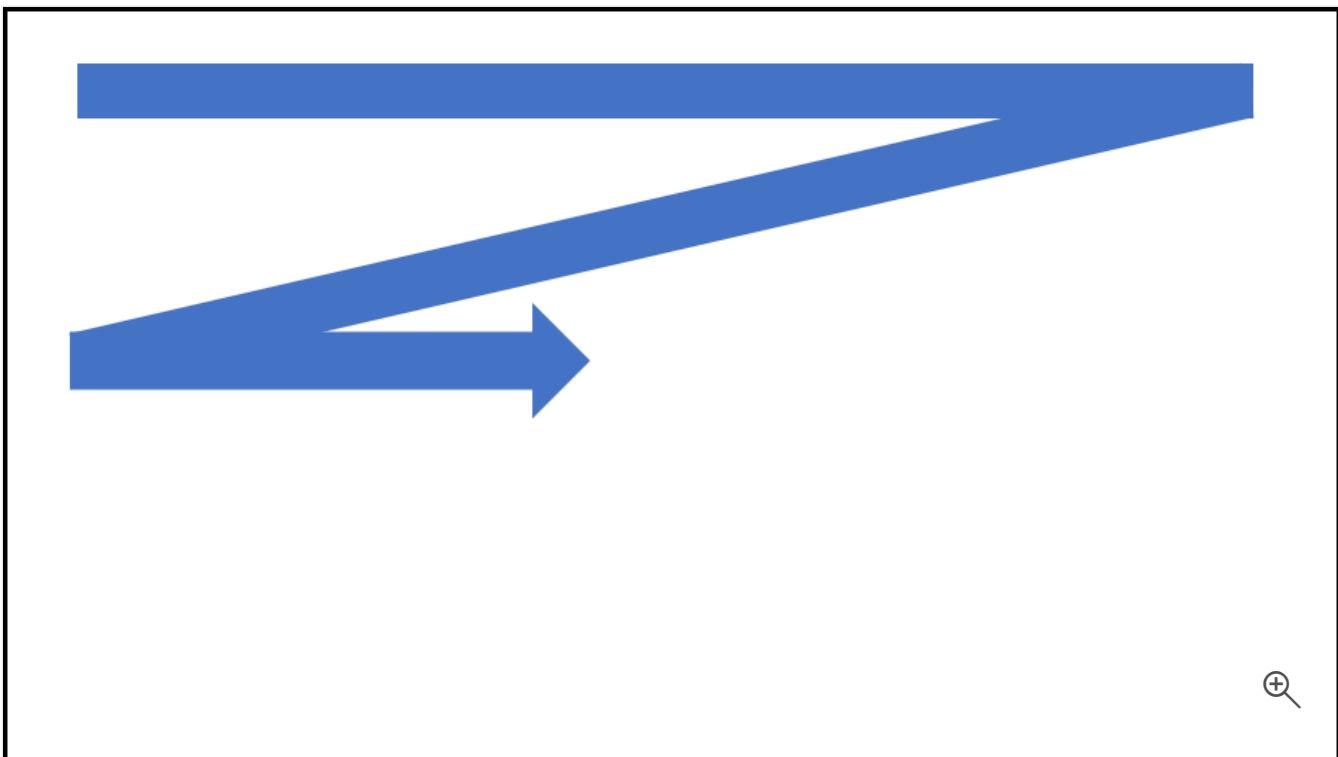
Additionally, good report design layouts should consider design principles of placement, balance, contrast, proximity, and repetition.

💡 Tip

Always keep in mind that the *less is more* adage applies; simplicity and clarity lead to good design.

Placement

Good placement of report objects contributes to an ordered report design. Generally, you should place the most important information in the upper-left corner of the page and arrange the report elements from left to right and top to bottom.

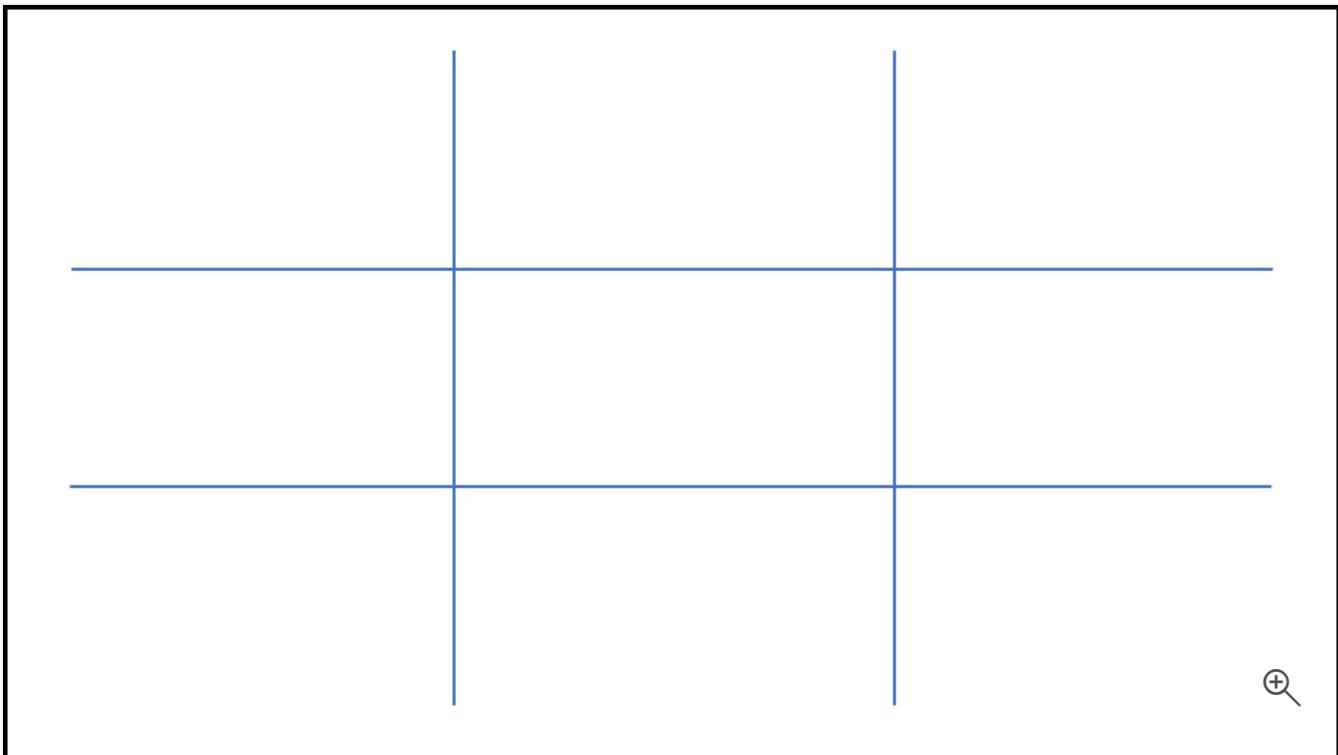


Note

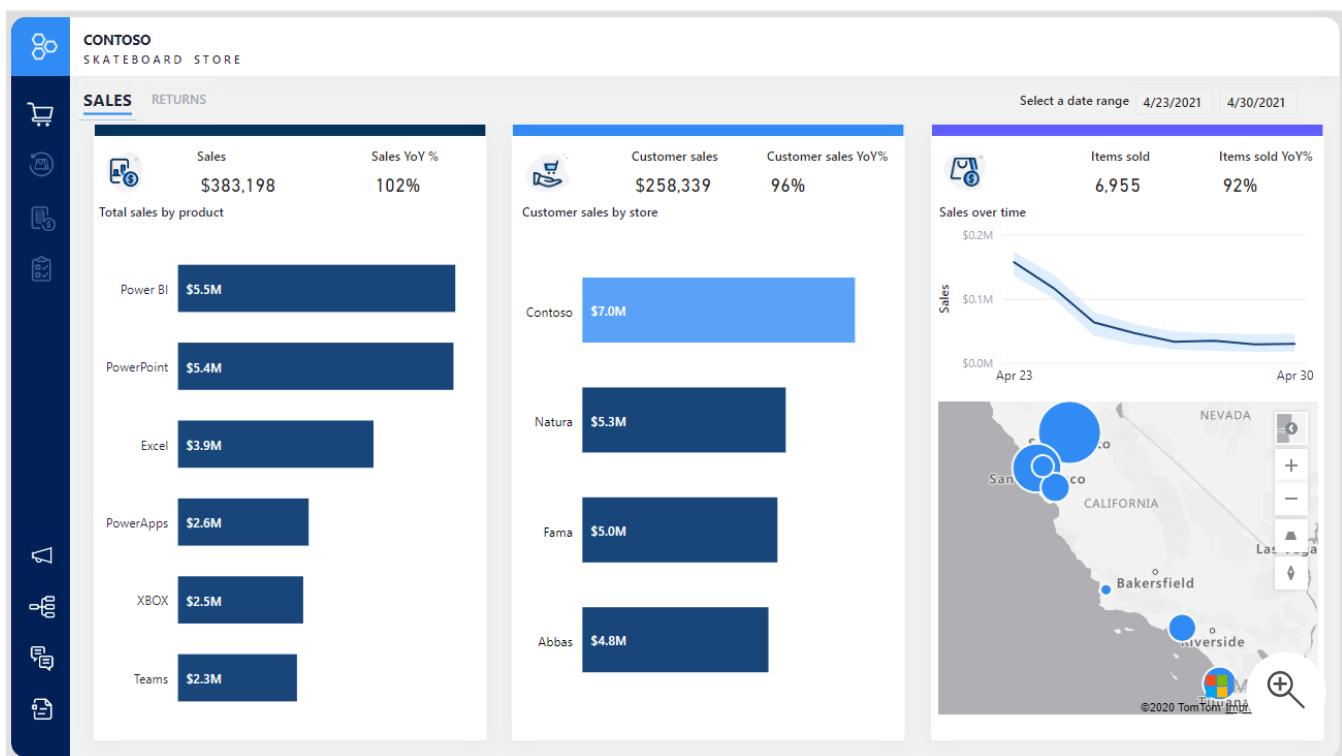
This placement applies to audiences who predominantly read left to right (LTR). When your audience reads right to left (RTL), as is the case with some written languages such as Arabic and Hebrew, place the most important information in the *upper-right* corner and arrange the report elements from *right to left*.

Arrange report objects so that the vertical and horizontal edges align because it looks ordered and is pleasing to the eye. Position-related report objects in logical groups. An ordered report layout creates a connection between visual elements and avoids clutter that can result from a seemingly random placement of report objects.

Additionally, aligning report objects in a visually pleasing layout can convey more energy and interest than simply centering or randomly placing report objects. Consider applying the *rule of thirds*, which is a visual arts rule that can be applied to report object placements in an analytical report. The rule proposes that a page layout should be divided into an invisible grid of nine equal parts. The grid is formed by two equally spaced horizontal lines and two equally spaced vertical lines. Then, report objects can be placed within the cells of the grid.



At the Contoso Skateboard Store, a proposed report design for analyzing sales presents three equally sized vertical regions. The first region shows sales broken down by product, the second region shows sales broken down by customer store, and the third region shows items that have been sold.



Balance

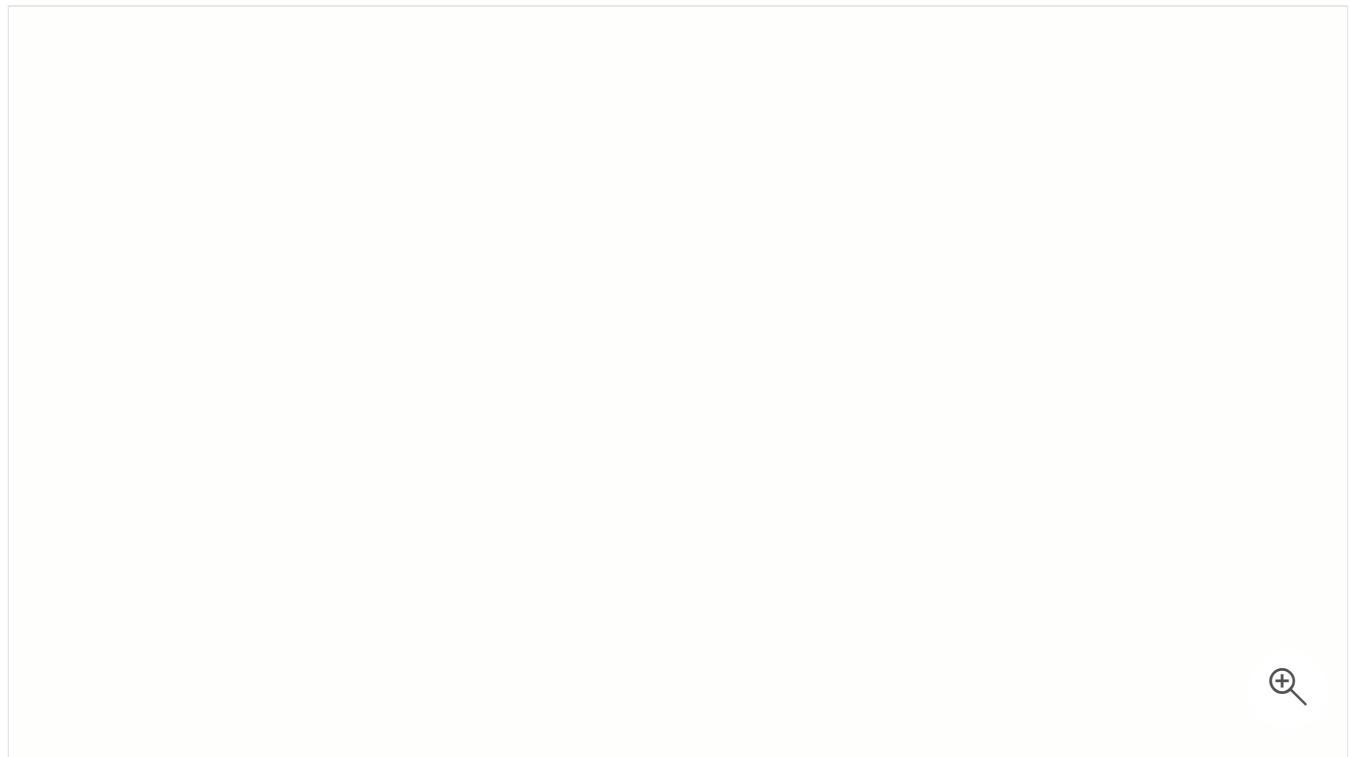
Another important consideration when you are laying out report objects is *balance*. Balance is concerned with stability and structure in design. In the context of a report layout, balance

refers to the weight that is distributed across the report page by the placement of objects of the same or different sizes.

Balance can be *symmetrical* or *asymmetrical*. Symmetrical balance is achieved by distributing the weight evenly on both halves of the page. Asymmetrical balance is achieved through contrast.

Consider using the *golden ratio* as a guide to produce asymmetrical balance. The ratio is based on the Fibonacci Sequence, where two quantities are in the golden ratio if their ratio is the same as the ratio of their sum to the larger of the two quantities. For centuries, the golden ratio has influenced art and architecture to produce works that are harmonious and balanced. If applied to report design, the golden ratio will align a page to have one large visual to draw initial attention, which is then supported by smaller visuals that provide context.

In the following animated image, notice how the report layout initially draws your eye to the larger charts. After you've comprehended the larger charts, observe that your eye is likely drawn to the bar chart and then to the values in the cards.

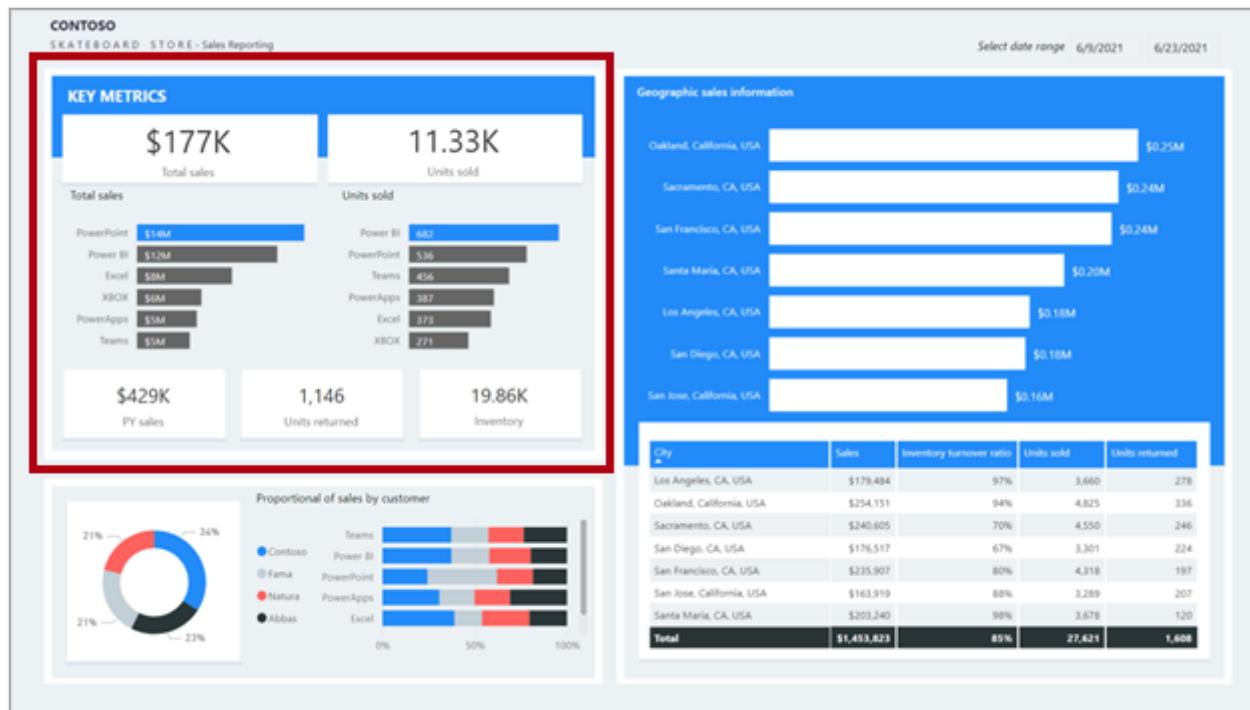


Proximity

In a report layout, proximity is concerned with the nearness of report objects. When a report page consists of multiple groups of related objects, you should use space to visually separate them.

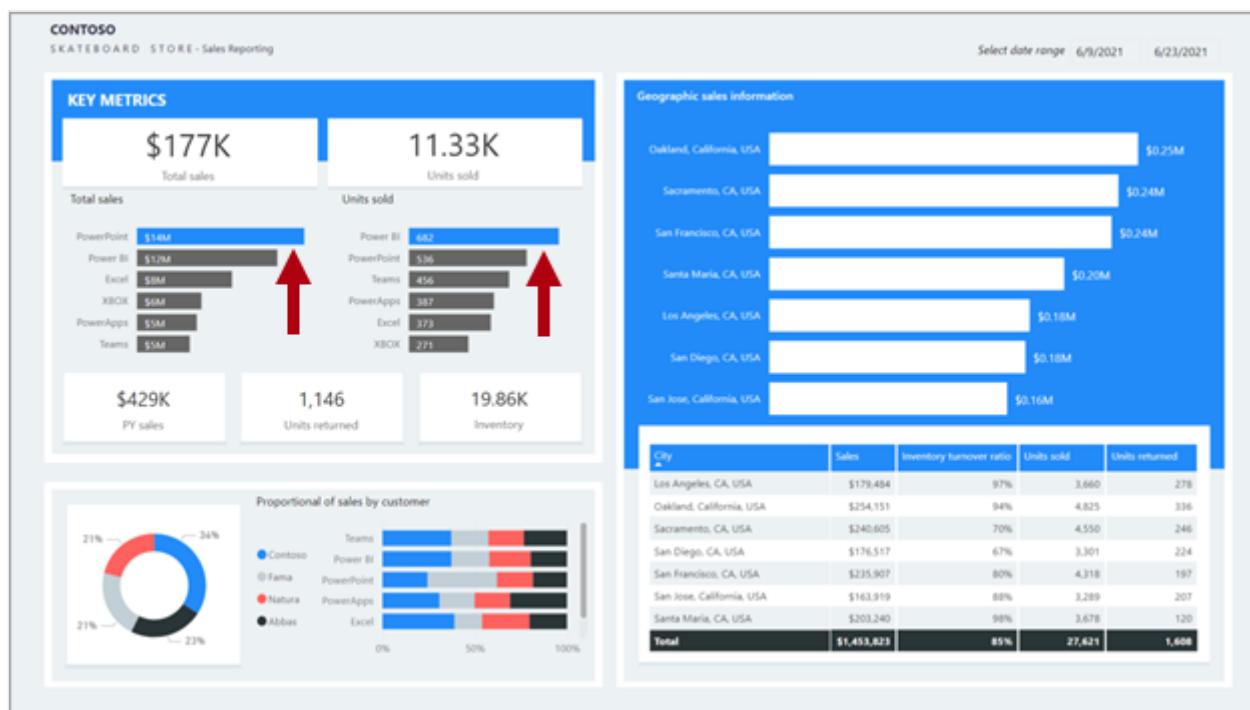
In the following report design, notice the top-left section labeled key metrics. Related visuals are placed near one another. They are also purposefully and consistently aligned forming a

clear section.



Contrast

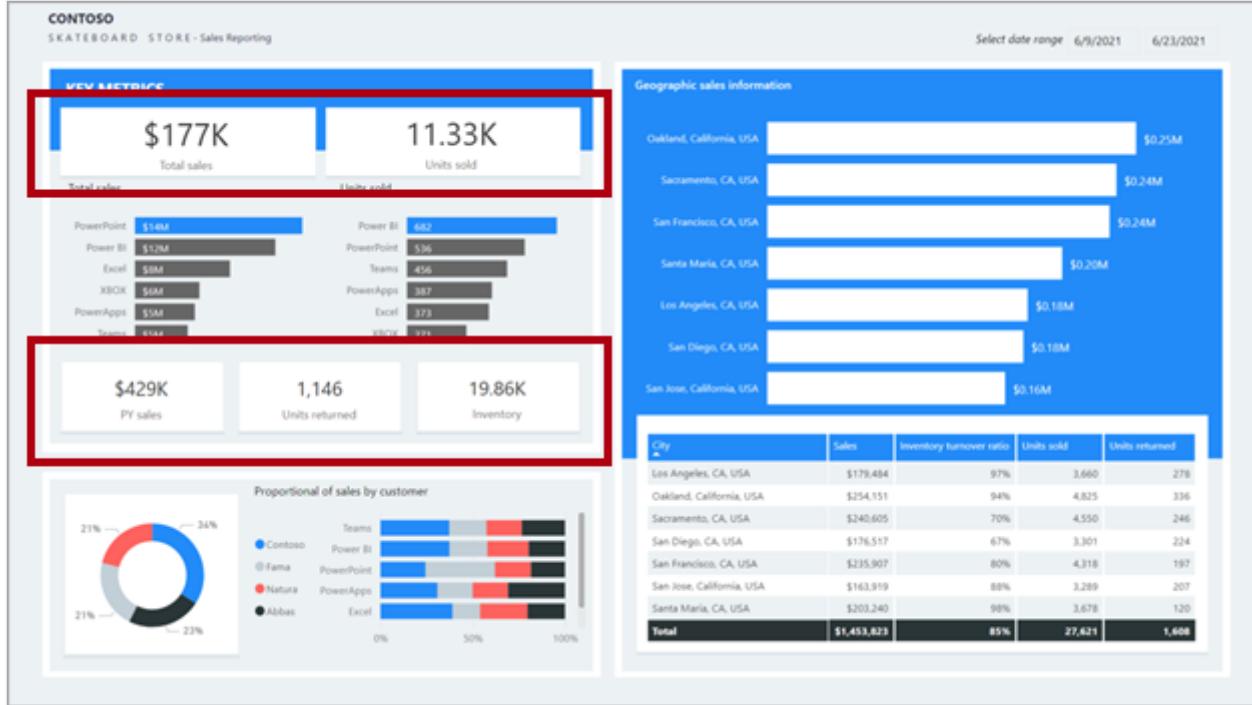
Contrast can be used to combine two opposing objects. The use of contrasting colors, fonts, font properties, or lines can emphasize important objects of the report design. Use this principle to direct report consumers to where they should look or which data visual they should interact with first.



Repetition

Repetition in a report design creates association and consistency. Good use of repetition can help strengthen a report layout by tying related report objects together.

In the following report design, notice the top-left section labeled **Key metrics**. Many key metrics are presented in single-value cards. This repetitious design allows report consumers to quickly understand and interpret the metrics.



Next unit: Design visually appealing reports

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How are we doing? ☆ ☆ ☆ ☆ ☆

Design visually appealing reports

9 minutes

Having the correct data and selecting the correct visuals is important. Equally as important is ensuring that the report is visually appealing. A well-designed report should guide the report consumer to quickly find and understand the answers to their questions.

While striving to produce an appealing report, bear in mind that the report should be user-friendly. Moreover, it might be possible to add more visuals to a well-designed report page without it appearing cluttered.

Space

Space is essential for an effective report design because it helps reduce clutter and increase readability. Spacing applies to the report page margins and the spacing between report objects.

Margins

Margins include the border area, or edge, around each page. Having a consistently spaced border area frames the report objects.

Because there isn't a report page property to set margins, it's up to you to lay out objects in way that results in a consistent border area. Margin sizes should be equal on the left and right, with possible variation on the top and bottom. Space across the top or bottom can show branding, titles, slicers, or other information that needs to be separated from the visuals.

The following report shows the consistent spacing (highlighted with dashed lines) around the border area of the page.



Object spacing

Ensure that you provide sufficient space surrounding, or within, report objects.

! Note

When visual headers are enabled, be sure to test that they don't overlap with nearby objects because overlapping objects can make interacting with visual header icons difficult. Appropriate spacing between visuals will help you avoid this problem.

Consider using different space depth to visually separate sections of related objects.

However, keep in mind that too much space can result in an unbalanced report layout and could draw the report consumer's attention away from what matters. Moderation is key: Always strive to produce an evenly spaced and balanced report.

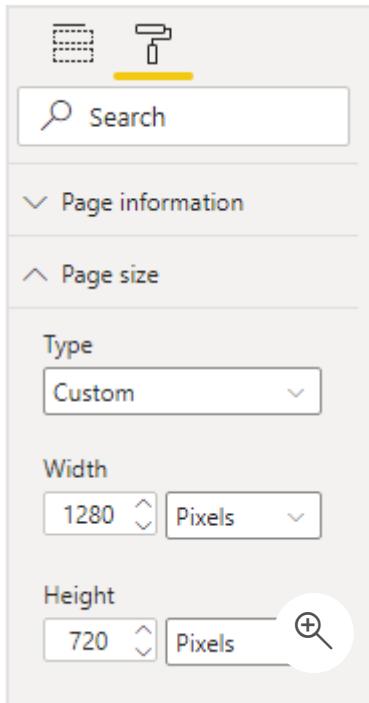
Spacing is described in more detail in the [Alignment](#) topic.

Size

Size can relate to the page size and visual size.

Page size

You can set the page size to predefined or custom dimensions. Additionally, you can set custom dimensions that are larger than the available screen size so that the report consumer will need to interact with scrollbars to view the entire page.



However, a large page size that is filled with visuals might take time to render, and visuals might not render in a top-to-bottom order.

Visual size

Generally, the more important the visual, the larger its size. Report consumers will quickly focus on larger visuals. When similar visuals are on the page, such as a series of card visuals, they should be equally sized.

Many visuals are responsive to size, so the visual will look appealing in either a small or large size. Consider that a line chart visual might appear like a sparkline when it's sized as small. In this case, only a few axis and data labels might appear. When the line chart visual is sized larger, more detail will be revealed, including many more axis and data labels.

While report consumers can use focus mode to enlarge a single visual, the visual should still clearly communicate its data when viewed at actual size on the report page. Focus mode can help consumers better interpret the data or more easily interact with the visual, such as expanding into levels of a matrix or decomposition tree visual.

Alignment

When multiple visuals are on the report page, ensure that they're properly aligned, meaning that the edges of visuals should be in alignment and the spacings between visuals are

consistent.

Alignment also relates to format options. For example, the alignment of titles and legends *within visuals* should be consistent.

Consider laying out the report page with different sections and aligning visuals appropriately within the sections. Sections can be *implied* or *explicit*.

Implied sections

Define implied sections by aligning groups of visuals in close proximity. The following example shows how spacing separates the visuals. This example demonstrates how well-applied spacing (highlighted with dashed lines) can convey association, and guide the report consumer's attention while providing balance and structure to the report page.



Explicit sections

You can define explicit sections by using colored shapes and overlaying aligned visuals on those shapes. The following example shows how the colored background shapes and spacing (highlighted with shading) separate the visuals into three sections.



💡 Tip

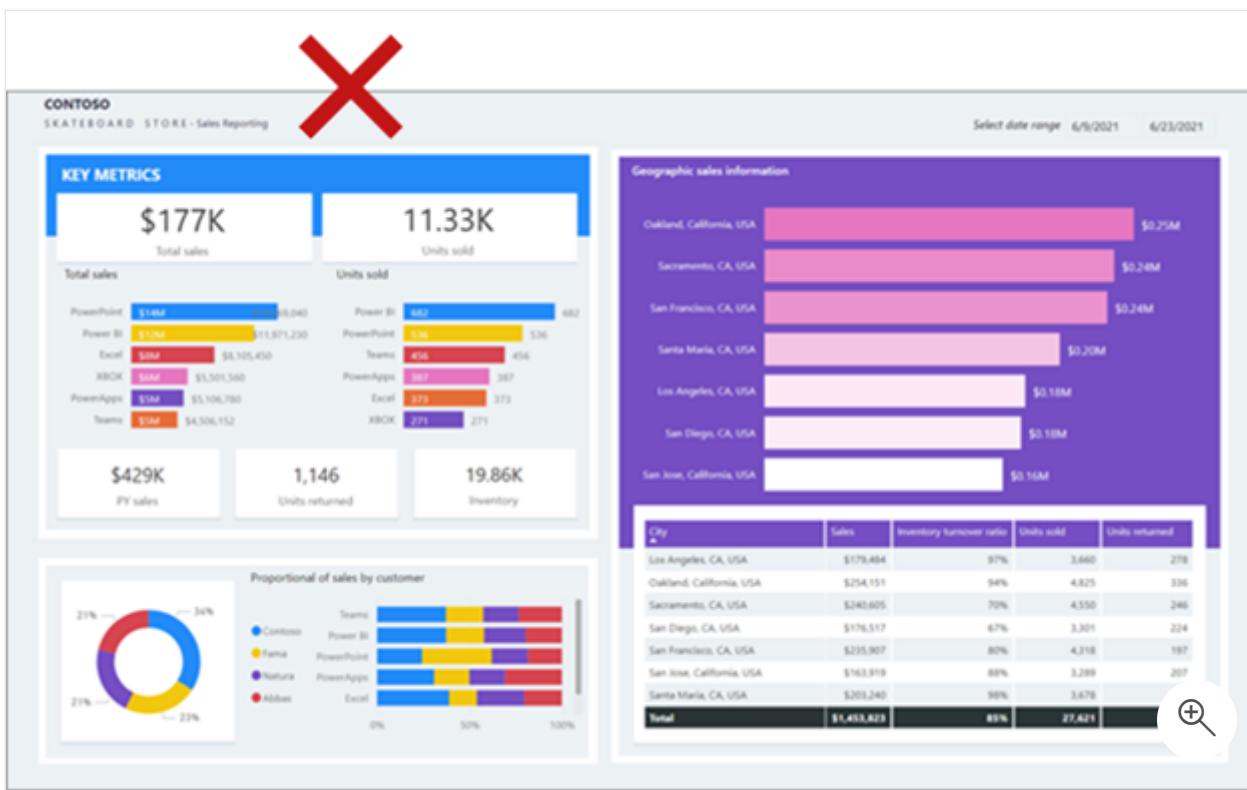
Use the alignment commands on the **Format** tab, which will help you quickly and accurately align visuals.

Color

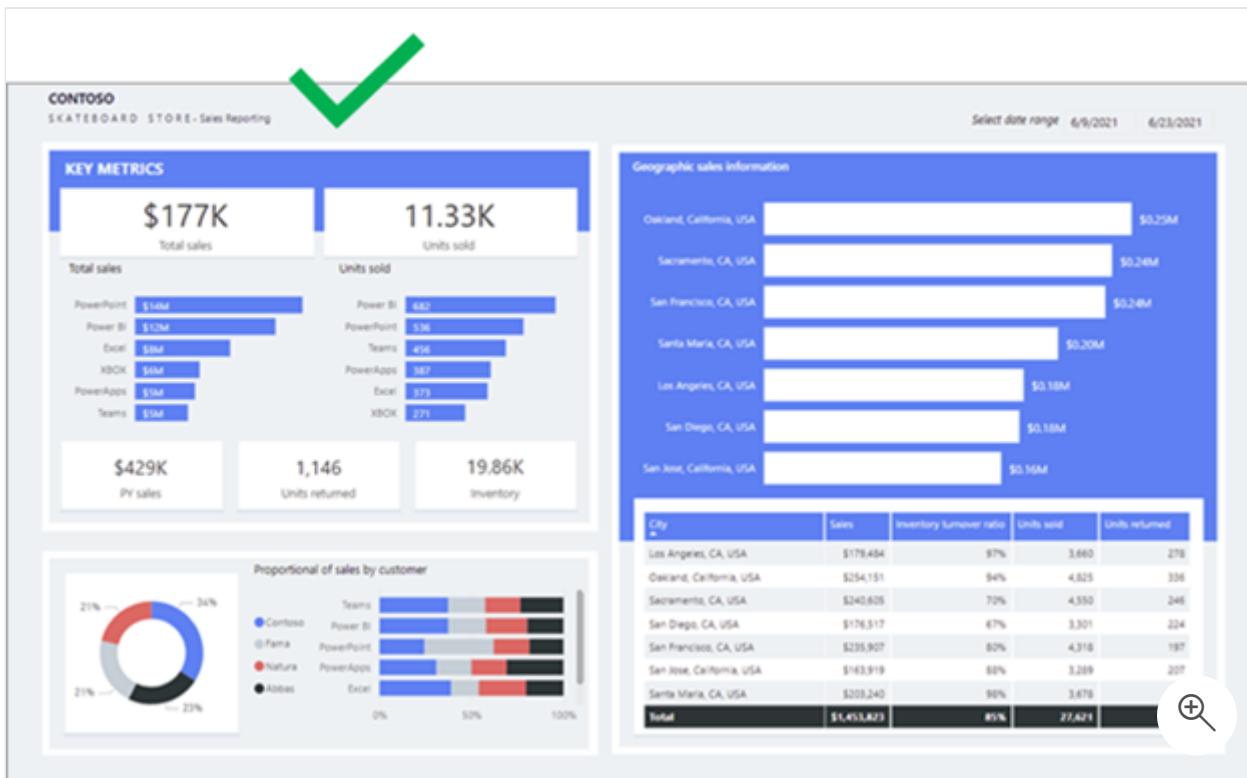
Use color sparingly and meaningfully because overusing it can be distracting. Stick to a few softer colors as a base, possibly aligned with corporate colors. Softer colors ensure that the data is the focus in your report. Reserve the use of bolder colors to highlight exceptions.

Ensure that colors are sufficiently contrasting. Color contrast is especially important to create accessible reports for report consumers who have low vision. This topic is described in more detail in Unit 5.

The following example shows several issues that are related to color. The colors that are applied on the left side of the page are different from those that are applied on the right side. Also, the colors are bright and can possibly distract the report consumer. Some colors, such as yellow, don't provide sufficient contrast with the white data labels.



In the following image, the report layout is improved with the use of better colors. The colors are now consistent and provide suitable contrast with the white data labels.

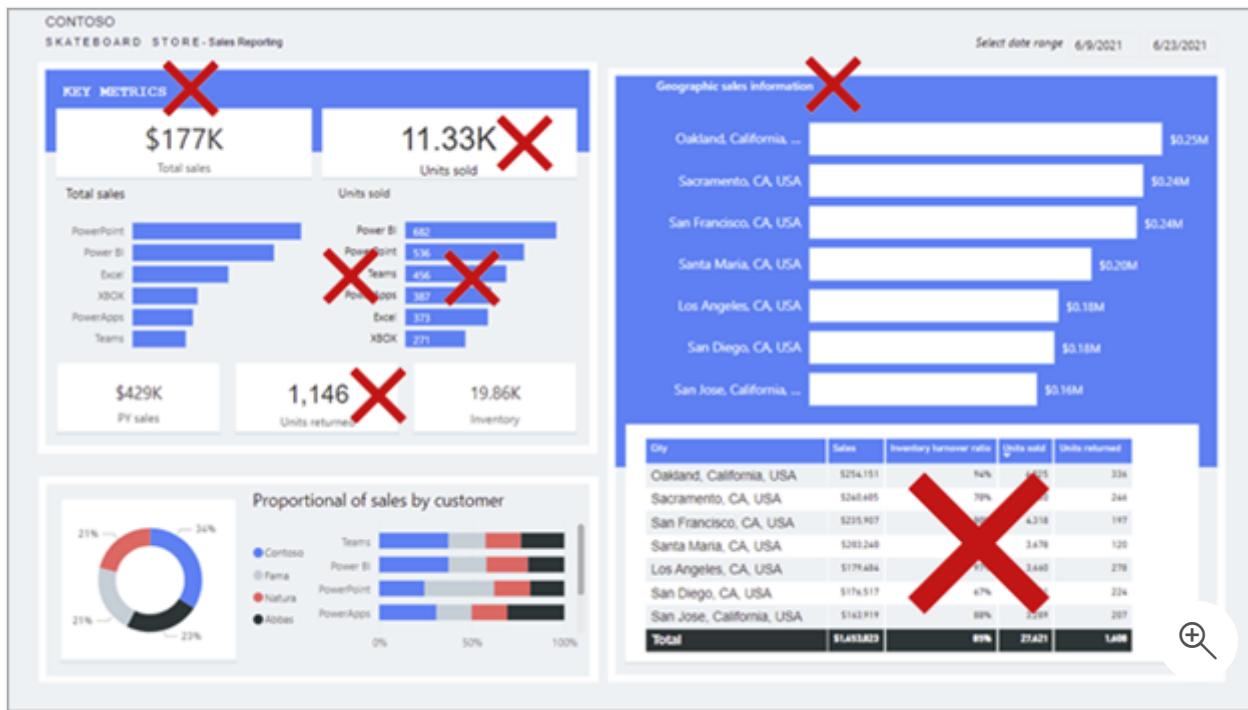


Consistency

Strive for consistency when you are laying out and configuring report objects. Consistency should apply to everything in your report design, including spacing, margins, size, alignment, and especially to object format options. Format options include the selection of font, font size,

font weight, colors, and many other styling options. Format options also include the enabling of visual features like axis labels and data labels.

The following example shows many inconsistencies, including mixed fonts, different font sizes, and inconsistent titles. At first glance, the report appears unbalanced.



The quickest way to enforce consistency is to use a *report theme*. A report theme applies format settings to your entire report, ensuring consistent application of colors, fonts, pages, and visual format options, including the **Filters** pane styles.

Consider using one of the many built-in themes from the theme gallery. You can use one as a starting point and then customize it to better meet your requirements. Alternatively, you can create a new theme, which can be considerable work initially, but will provide you with granular control.

Note

Be aware that the theme will be overridden when you explicitly configure a format option. For example, you can explicitly set a color by entering a HEX value instead of selecting a color from the palette. Try to limit overriding the report theme to an exception basis because if you switch themes, overridden properties won't update.

Be sure to export the report theme, which is a JSON file, and then apply it to other reports to ensure consistency across all reports.

Tip

You can use an external site like [powerbi.tips](#) to generate a theme. The site will guide you through building a color palette and setting property values for all core visual types.

For more information, see [Use report themes in Power BI Desktop](#).

Next unit: Report objects

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How are we doing?

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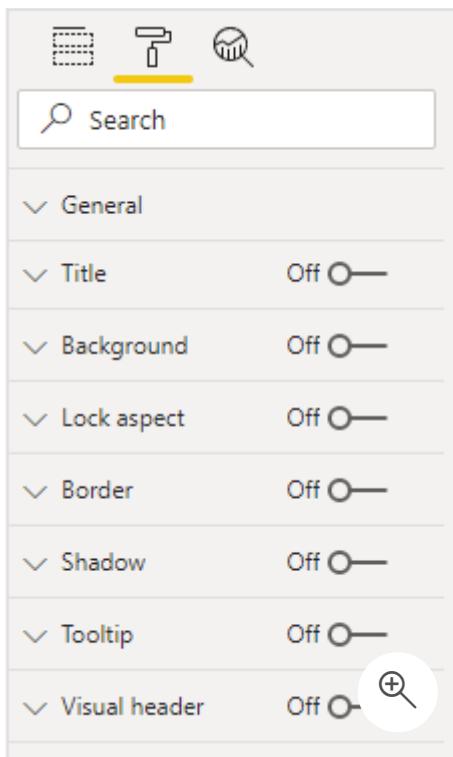
Report objects

7 minutes

Report objects are laid out on each report page and include:

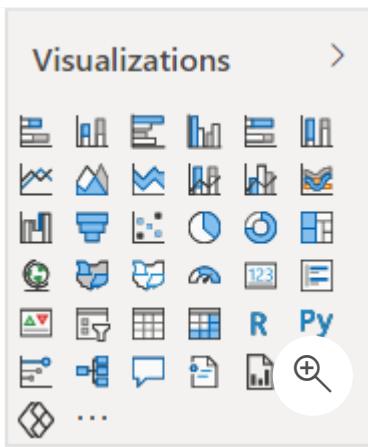
- **Visuals** - Visualizations of dataset data.
- **Elements** - Provide visual interest but don't use dataset data.

All report objects have some properties in common, which can be set in various sections of the **Format** options. Commonly applied settings include general properties (location, size, and alt text), title, background, border, and shadow.



Visuals

Visuals are visualizations of dataset data. Power BI includes over 30 *core visuals*, which are built in and available to all reports. You can access the core visuals in the first section of the **Visualizations** pane.



Tip

To learn what a visual icon in the **Fields** pane represents, hover the cursor over it to reveal the visual type in a tooltip.

You can also extend the core visuals with *custom visuals*. Custom visuals are sourced from Microsoft AppSource (an app store for business applications such as Microsoft Office 365, Microsoft Dynamics 365, Power BI, or separate Microsoft Azure web apps) or uploaded as a .pbviz file.

You can use the following general methodology to add and configure a visual:

1. Select the visual type in the **Visualizations** pane and then position and size it on the page.
2. Map dataset fields to populate the visual. Each visual has one or more *wells*. The number and type of wells differ between visuals. Some visuals, like the slicer, have a single well, but others have many more.
3. Optionally, apply visual-level filters.
4. Modify field mappings, possibly renaming fields, modifying summarization behavior (or restricting summarization), or enabling the **Show items with no data** option.
5. Optionally, modify the sort field and the sort direction (in ascending or descending order).
6. Optionally, apply format options to produce the desired result and style.
7. Optionally (and when supported), use the **Analytics** options to overlay supporting data, like minimum or maximum lines, or Artificial Intelligence (AI) results like anomaly detection and forecasts.

Note

Steps 2-4 define the analytic query, which is concerned with filtering, grouping, and summarizing data.

To gain a better understanding of this general methodology, watch the following video, which demonstrates how to configure a report visual.

This module doesn't intend to describe each visual in detail. In the next unit, visuals are grouped into visualization requirements together with guidance on when to and when not to use them.

Tip

For a complete list and explanation of the core visuals, see [Visualization types in Power BI](#).

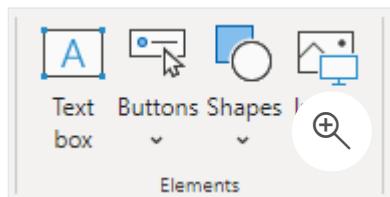
Additionally, this module doesn't intend to describe each visual format or analytic option.

Tip

A great way to learn how to format a Power BI visual is by experimentation. The **Format** options include a search box that you can use to help narrow down and locate a particular setting. To learn what a setting does, configure it and then observe the result. If it doesn't produce the expected result, press the **Ctrl+Z** keyboard shortcut to revert to the original setting.

Elements

Elements provide visual interest but don't use dataset data (with one exception, which is described later).



The four types of elements are:

- **Text box** - Add rich text, such as the title, to the report page. You can selectively apply font type and font size and then set the color, styling (bold, italics, or underline), and paragraph alignment (right, center, or left). You can insert hyperlinks, too.
- **Buttons** - Add buttons so that report consumers can interact with the report as they would an app. Buttons can perform different actions, such as return to the previous page, navigate to a specific page, drill through to a page, select a bookmark, open Q&A, or open a web URL in the default web browser.
- **Shapes** - Add a shape to the report as decoration or to behave like a button to perform an action. Almost any conceivable shape is possible, from basic shapes to arrows and even hearts. Shapes can include text and can be formatted and styled in many different ways.
- **Image** - Upload an image, such as your company logo, to the report page. Supported image types include BMP, JPEG, GIF, TIFF, and PNG. Similar to the **Shapes** element, images can behave like buttons to perform an action.

The text box deserves a special mention because it's capable of embedding *dynamic values* that are sourced from the report dataset into paragraphs of text. When the page is filtered, dynamic values are filtered. Technically, the text box isn't a visual. However, in this instance, it behaves like one. It's also available as the *smart narrative* visual, which automatically summarizes data by using text descriptions and insights.

The screenshot shows the Q&A feature in Power BI. At the top, there are two dropdown menus, a font style icon (A), a bold icon (B), a divide icon (/), a underline icon (U), and three alignment icons (left, center, right). Below this is a navigation bar with 'Value' and 'Review' tabs, where 'Value' is selected. A large text area below says 'Create a dynamic value that updates with your data'. Underneath, a question box contains 'How would you calculate this value?' and a placeholder 'Ask a question about your data'. A 'Result' section is shown with a large empty box and a numeric format toolbar above it. The toolbar includes a currency symbol (\$), a percentage symbol (%), a decimal separator (,), and a thousands separator (,). A 'Name your value' input field contains '# Value'. At the bottom right are 'Save' and 'Cancel' buttons.

At design time, you can start with a text box, or you can add the smart narrative visual from the **Visualizations** pane. However you start, the end result will be the same. Then, you can add a dynamic value by using Q&A to ask a question. Additionally, you can format the values.

Next unit: Select report visuals

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How are we doing? ☆ ☆ ☆ ☆ ☆



Select report visuals

12 minutes

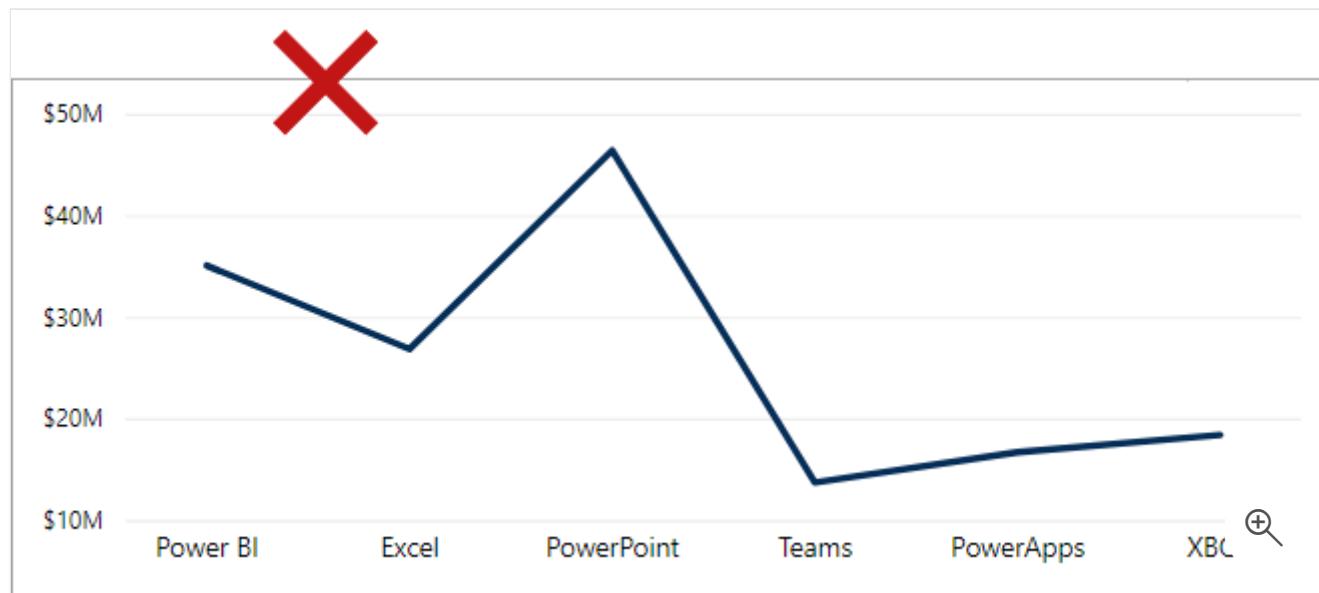
The primary goal of data visualization is to communicate information clearly and effectively to report consumers. That's why selecting the most effective visual type to meet requirements is critical. Selecting the wrong visual type could make it difficult for report consumers to understand the data, or worse, it could result in the misrepresentation of the data.

Visual selection can be challenging because so many visuals are available to choose from. To help you select an appropriate visual, the following sections provide tips and guidance to help you meet specific visualization requirements.

Categorical visuals

Often, bar or column charts are good choices when you need to show data across multiple categories. Selecting which type depends on the number of categories and the kind of information that you want to visualize. For example, if many category values are available, you should avoid selecting a visual where color is used to split the data, such as a stacked bar chart with a category legend. Instead, use the category dimension on the axis of a bar chart.

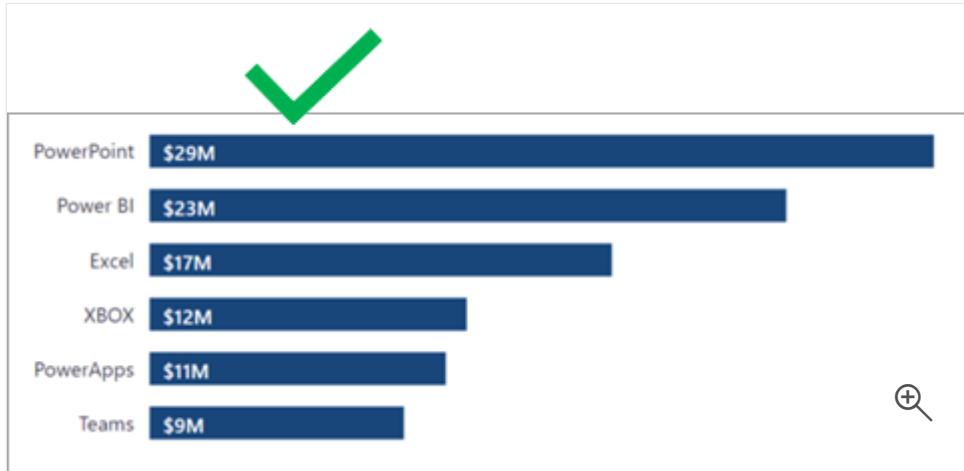
Additionally, you should avoid a line chart with a categorical X-axis because the line implies a relationship between elements that might not exist. In the following example, notice that the line chart visual implies a relationship between the product categories on the X-axis.



In the next example, a bar chart shows sales by product category. Notice that the visual is sorted by sales values in descending order. Mostly, you should sort categorical charts by value rather than in alphabetical category order. Make sure that you determine the sort order (ascending or descending) by what you want to first draw peoples' attention to so that it provides the report consumer with an intuitive visual that is organized to produce a natural flow.

! Note

You should sort by category when an established sequence is in place, such as steps in a process that should be displayed in that order.



Time series visuals

Always use a line or column chart to show values over time. The X-axis should present time, sorted from earliest to latest periods (left to right).

! Note

This placement applies to audiences who predominantly read left to right (LTR). When your audience reads right to left (RTL), as is the case with some written languages, sort the X-axis from right to left.

In the following example, a line chart shows historical sales. The line chart shows the natural flow of a timeline from left to right, eliminating the time needed to interpret the X-axis.



You can bring the line chart to the next level by adding an analytics option. In this case, it applies a [forecast](#) to extend historical sales with projected sales.



Line charts work well with a consistent flow of data, such as when sales are recorded for every period. If no sales are recorded for some periods, the line chart visual will fill such gaps with a straight line that connects the values of the previous and next periods. If missing values are a possibility, a column chart might be a better visual choice because it will help to avoid the interpretation of a non-existent trend.



Other Power BI core visuals that you can use for time series data include:

- Stacked column chart
- Area chart
- Line and stacked column chart
- Ribbon chart, which has the added benefit of showing rank changes over time

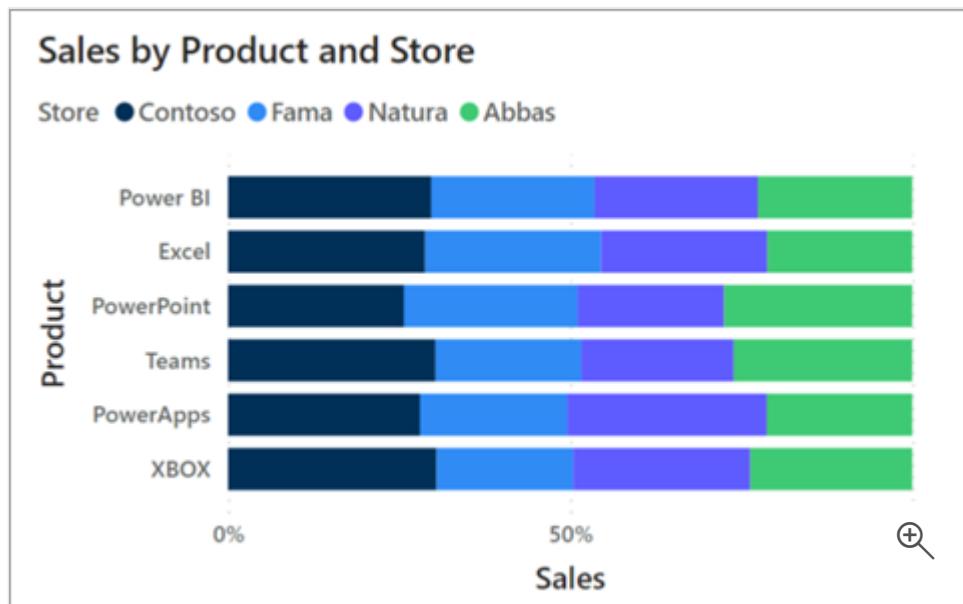
Proportional visuals

Proportional visuals show data as part of a whole. They effectively communicate how a value is distributed across a dimension. Column and bar chart visuals work well for visualizing proportions across multiple dimensions.

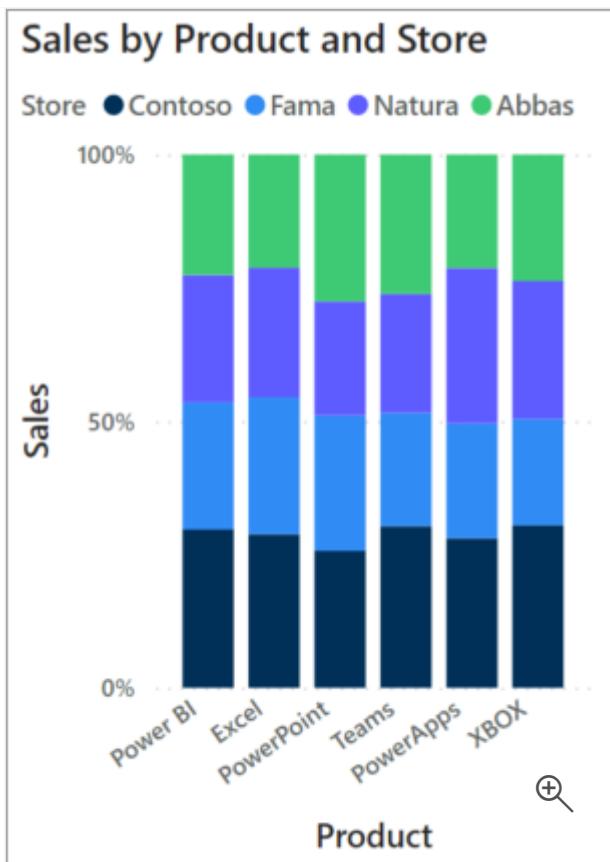
Note

Proportional visuals can't plot a mix of positive and negative values. They should be used when all values are positive or all values are negative.

In the following example, a 100% Stacked Bar chart visual shows proportional sales across four stores. It allows you to compare each store across the six product categories. Notice that the actual sales value isn't shown. Instead, the proportion of sales is shown, allowing report consumers to determine which one is higher. (If necessary, you can reveal the actual values in a tooltip.)



In the next example, notice that the same information can be expressed vertically as a 100% Stacked Column chart. It yields an equivalent result.



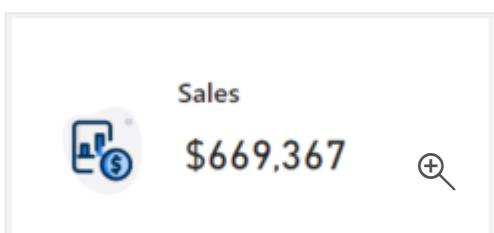
Other Power BI core visuals that you can use for proportional visualization include:

- 100% Stacked Column chart
- Funnel chart
- Treemap
- Pie chart
- Doughnut chart

Numeric visuals

Often presented by card visuals, numeric values show high-level callouts that demand immediate attention. They can be powerful in dashboard and analytical reports because they communicate important data quickly.

In the following example, a card visual shows a single value that is quick and simple to read.



You can also use a multi-row card to display multiple values in a single visual.

Grid visuals

Often overlooked, tables and matrices can effectively convey a lot of detailed information. Tables have a fixed number of columns, and each column can express grouped or summarized data. Matrices can have groups on columns and rows. Adding conditional formatting options, such as background colors, font colors, or icons, can enhance values with visual indicators. This extra context supports simple report consumption and can bring balance to a report page.

Additionally, matrices provide one of the best experiences for hierarchical navigation. They allow users to drill down, on the columns or rows, to discover detailed data points of interest.

The table and matrix **Format** options provide a high degree of control to format and style grid values.

In the following example, a table visual shows sales and units sold by product. Showing these metrics together in a single visual can be a challenge because the scale of values for sales and units is so different. But by applying conditional formatting, data bars help report consumers quickly understand the distribution of values. Notice that the products are sorted by sales values in descending order, drawing attention to the product with the highest sales.

Product	Sales	Units sold
Power BI	\$244,885	2,881
PowerPoint	\$172,320	2,154
Excel	\$102,250	2,045
Teams	\$88,144	3,148
PowerApps	\$80,496	2,236
XBOX	\$74,400	
Total	\$762,495	

In the next example, a matrix visual displays inventory by product and by store. It uses conditional formatting to show indicators, which provide visual cues to understanding the data.

Inventory on hand breakdown				
City	On hand	Inventory turnover ratio	Days sales of inventory	
Los Angeles, CA, USA	32	100% ★	✓	
Power BI	2 ○	100% ★	✓	
Excel	0 ○	100% ★	⚠	
PowerPoint	0 ○	100% ★	⚠	
Teams	30 ○	99% ★	⌚	
PowerApps	0 ○	100% ★	⌚	
Total	1,706	97% ★	✓	

Performance visuals

Communicating performance involves describing a value and its comparison to a target. Any difference between the value and target is its variance, which can be favorable or unfavorable. Color or icons can convey status. For example, when the variance is unfavorable, you can display a red color or an exclamation mark (!) icon.

In the following example, a KPI visual shows the number of items sold. It also adds context by showing how that value compares to target.



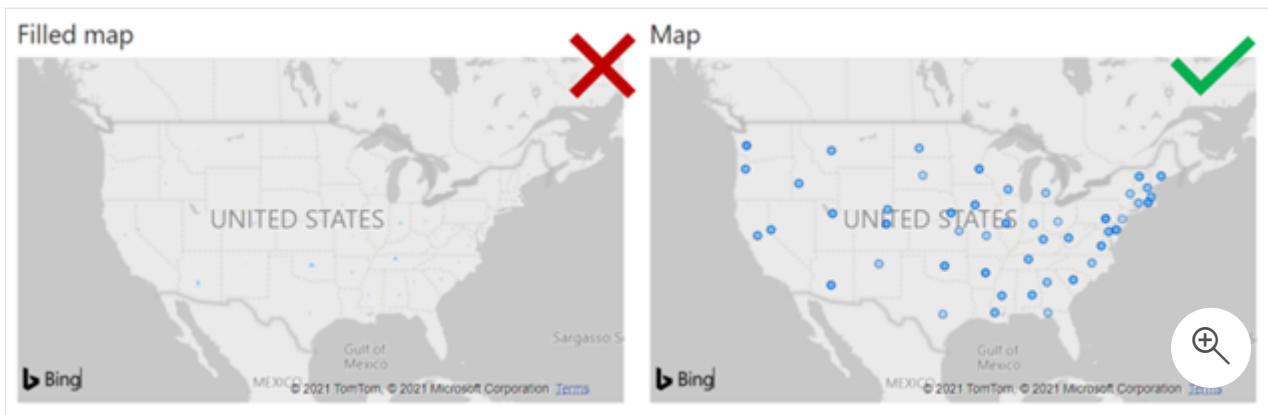
Other Power BI core visuals that you can use to show performance include:

- Gauge
- KPI
- Table, with conditional formatting
- Matrix, with conditional formatting

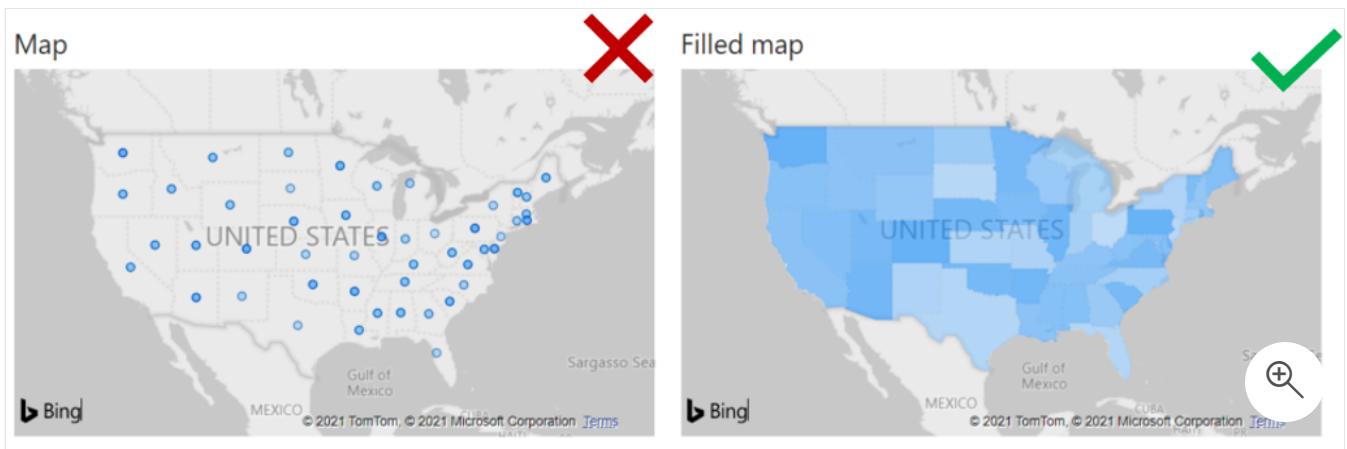
Geospatial visuals

When a dataset has geospatial information, it can be conveyed by using map visuals. Power BI includes several core map visuals. Each visual offers various formatting options that, when appropriately applied, can help highlight geospatial data.

In the following example, sales by city are displayed by using a Map visual and a Filled map visual. In this instance, the granularity of the data is at the city level and the perspective is the entire United States. Because a high dispersion is between plot points, the Map visual (which shows a bubble for each city) produces a helpful result. The Filled map visual of the United States can't sufficiently convey city sales.



If you raise the granularity to state level, the **Filled map** visual will produce a better result than the **Map** visual. Then, report consumers can determine relative sales by interpreting the color graduations.



! Note

A map visual can occupy considerable space on the report page. Also, geospatial data doesn't always need to be shown in maps. If location isn't highly relevant to the requirements, consider using a categorical visual instead.

Next unit: Select report visuals to suit the report layout

[Continue >](#)

How are we doing? ★ ★ ★ ★ ★

✓ 100 XP



Select report visuals to suit the report layout

2 minutes

Often, you can choose between multiple visual types to meet design requirements. To narrow down the selection, you can choose the visual that best fits the available space on the report page. Use a visual that is aesthetically pleasing while maximizing the use of the available page space.

The following examples show two visuals side by side: a 100% Stacked Bar chart visual and a 100% Stacked Column chart visual. Each visual shows the same data and occupies the same space on the page. One visual is easier to read. In this instance, the 100% Stacked Bar chart visual helps make it easier for you to determine relative values and trend. The reason is because the visuals occupy a wide yet short area: The lengths of the *long* bars are easier to interpret than the heights of the *short* columns.



This situation isn't always the case. When the visual needs to fill a narrow yet tall space, the 100% Stacked Column chart is more effective. The heights of the *tall* columns are easier to interpret than the lengths of the *short* bars.



Next unit: Format and configure visualizations

[Continue >](#)

How are we doing? ☆ ☆ ☆ ☆ ☆



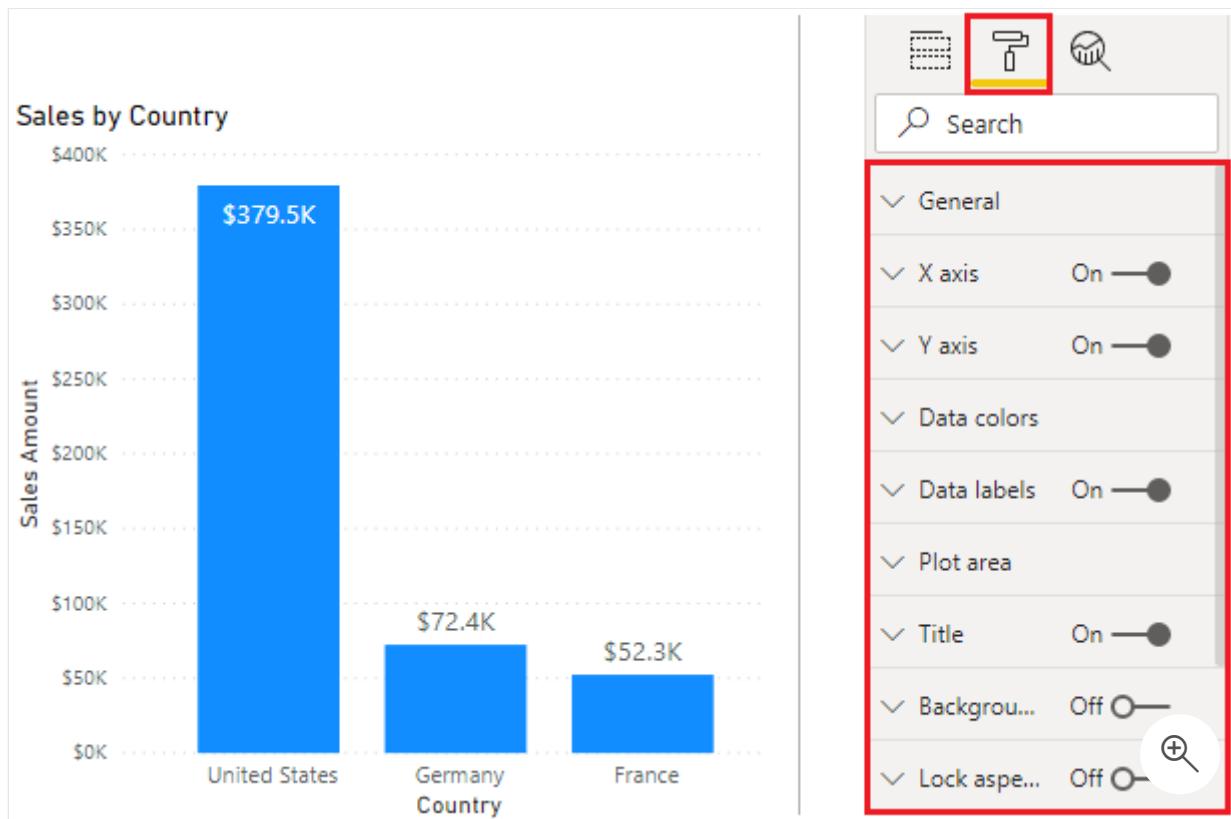
Format and configure visualizations

6 minutes

Power BI Desktop gives you a variety of options for customizing how your selected visualizations look, such as the colors and format of the text that they contain. You should take time to explore the options to determine what impact they each have on a visual.

In this example, you will format and configure the default clustered column chart visualization to better meet the needs of your report requirements.

Start by selecting the visualization on the canvas, and then select the **Format** button (paint roller icon) to display the **Format** pane.



The formatting options that are available will depend on the type of visualization that you selected.

Common formatting options include the **Title**, **Background**, and **Border**. In the **Title** section, you can add a title to the visual, if it does not have one, or edit the title, if it has one already. The aim of the title is to clearly describe what data is being presented in the visual. You can format the title by changing the text, text size, font, color, background, and alignment. The subsequent section shows an example of customizing a title.

In the **Background** section, you can set any color or image as the background for the visual. If you plan to use an image as a background, try to select an image that won't have lines or

shapes that would make it difficult for the user to read the data. It is best to keep a white background so the presented data can be clearly seen. The subsequent section shows an example of customizing a background.

In the **Border** section, you can set a border around the visual to isolate the visual from other elements on the canvas, which helps make it easier for the user to read and understand the data. You can change the border color and radius to be consistent with your color scheme.

If a **General** section is available, you'll be able to set the precise size and place for your visual on your canvas. This option might be suitable if the drag-and-drop feature is not placing the visual exactly where you want it to be. It can also be useful to ensure that you have aligned specific visuals consistently.

You might also be able to format the colors and labels for specific data values. In the **Data colors** section, you can set the colors that you want to use for the data values in the visual. You can use different colors for different fields, but always try to be consistent when it comes to selecting those colors. It is best to use the same color scheme throughout the report. In the **Data labels** section, you can change fonts, size, and colors for all labels in the visual. Try to use solid colors so the labels are clearly visible. For example, if the background is white, use a black or dark grey color to display your labels.

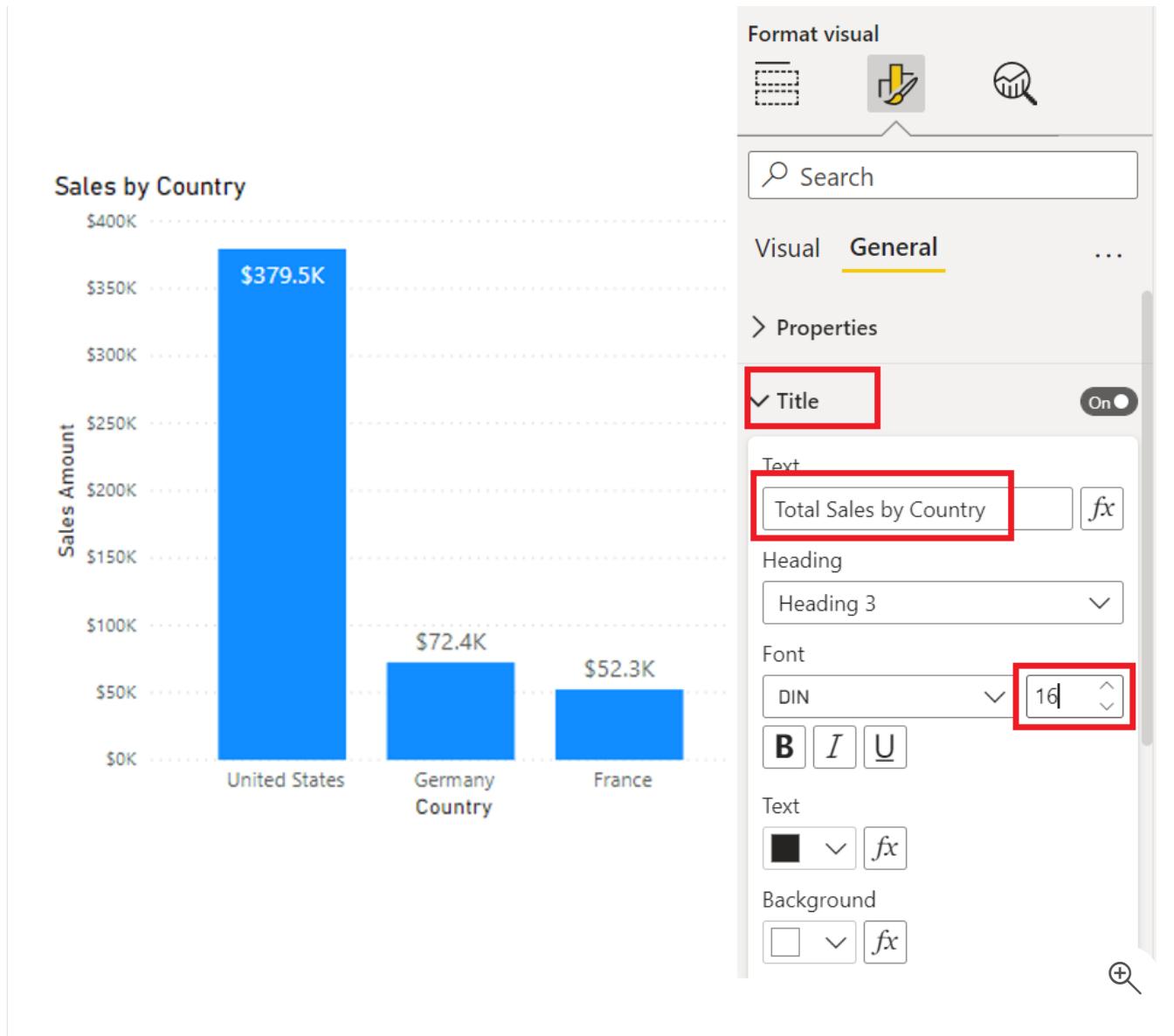
The **Tooltips** section allows you to add a customized tooltip that appears when you hover over the visual, based on report pages that you create in Power BI Desktop. Tooltips is a great feature because it provides more contextual information and detail to data points on a visual. The default tooltip displays the data point's value and category, but your custom tooltips can include visuals, images, and any other collection of items that you create in the report page. The subsequent section shows an example of customizing a tooltip.

As you make changes in the **Format** pane, notice that the visualization updates immediately to reflect those changes. If you need to revert the changes that you make, select the **Revert to default** option at the bottom of each section in the **Format** pane.

In the following examples, you will edit the title, change the background, and add a tooltip.

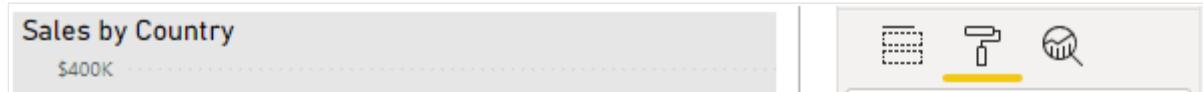
Title

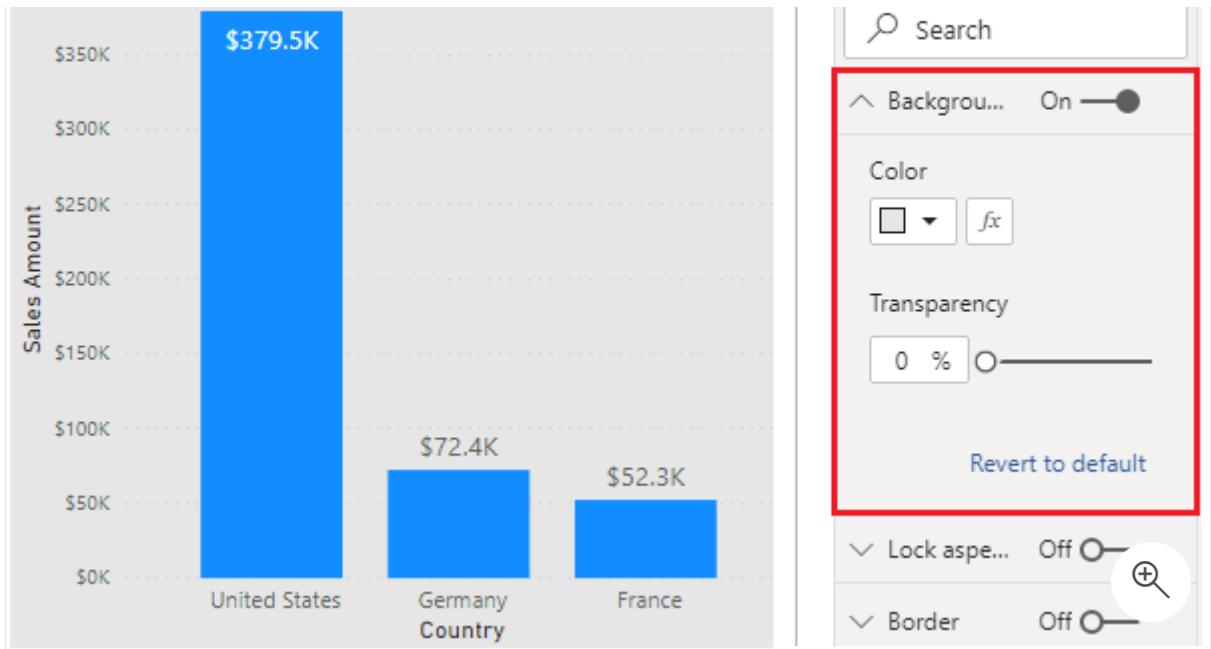
You can edit a default title and add a title, if you don't have one. In this example, you will select the column chart visualization and then, in the **Format** pane, scroll down and expand the **Title** section. Edit the current title by changing it to **Total Sales by Country**, and then increase the font size to 16 points.



Background

It is best practice to keep the default white background so the presented data can be clearly seen. However, you can change the default background color to make a visualization more colorful and easier to read or to match a particular color scheme. In this example, continue with the column chart that is selected and then, in the **Format** pane, expand the **Background** section and change the color to light grey.



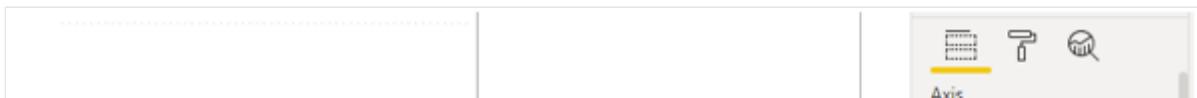


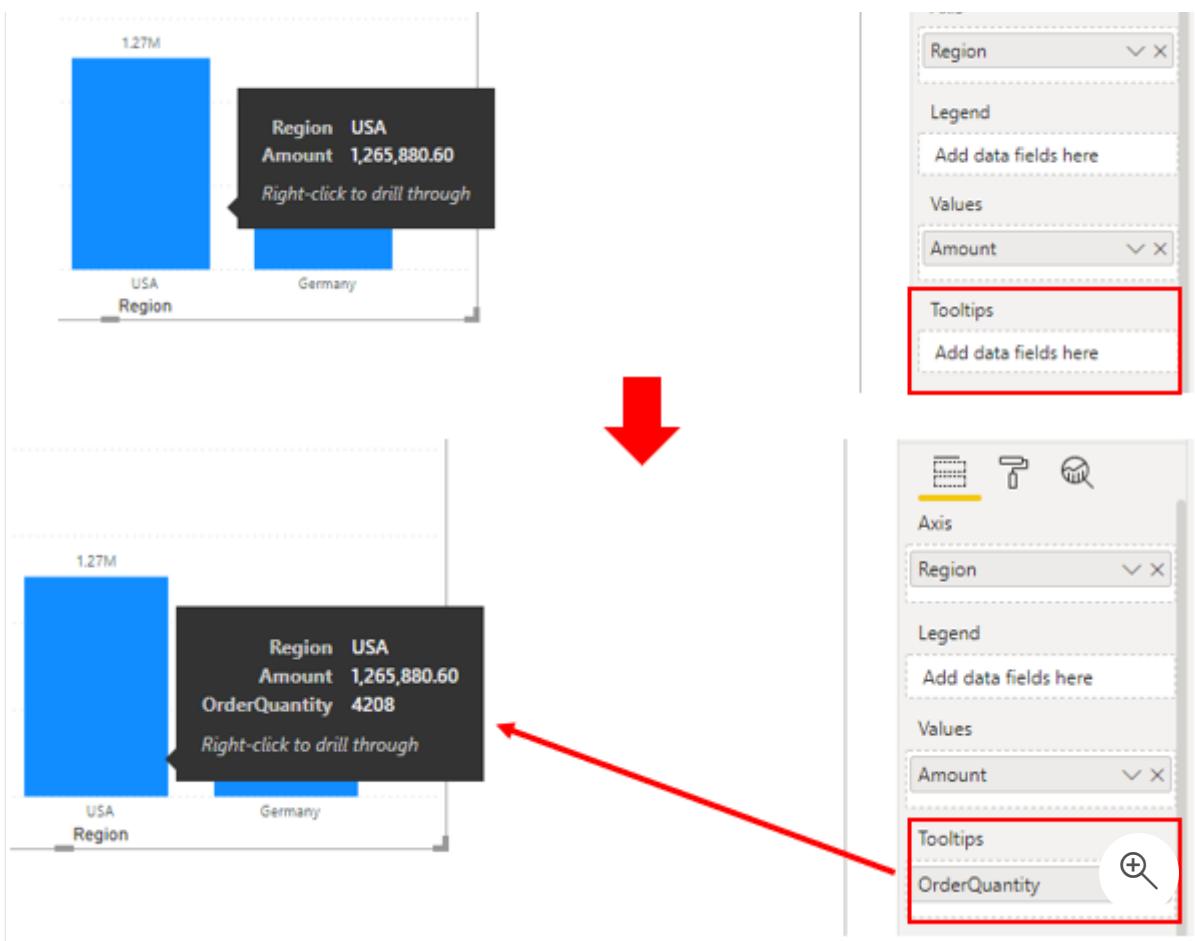
Tooltip

Using tooltips is a clever way of providing more contextual information and detail to data points on a visual. When you add a visual, the default tooltip displays the data point's value and category, but you can customize this information to suit your needs. For example, you might want to provide your report users with additional context and information, or specify additional data points that you want users to see when they hover over the visual.

To expand on the data points that are displayed in the default tooltip, you can drag a field from the **Fields** panel into the **Tooltips** bucket. However, you should not add many more fields to the tooltips because adding too many fields can introduce performance issues and slow down your visuals.

The following image shows the default tooltip first and then the customized tooltip that displays additional data.

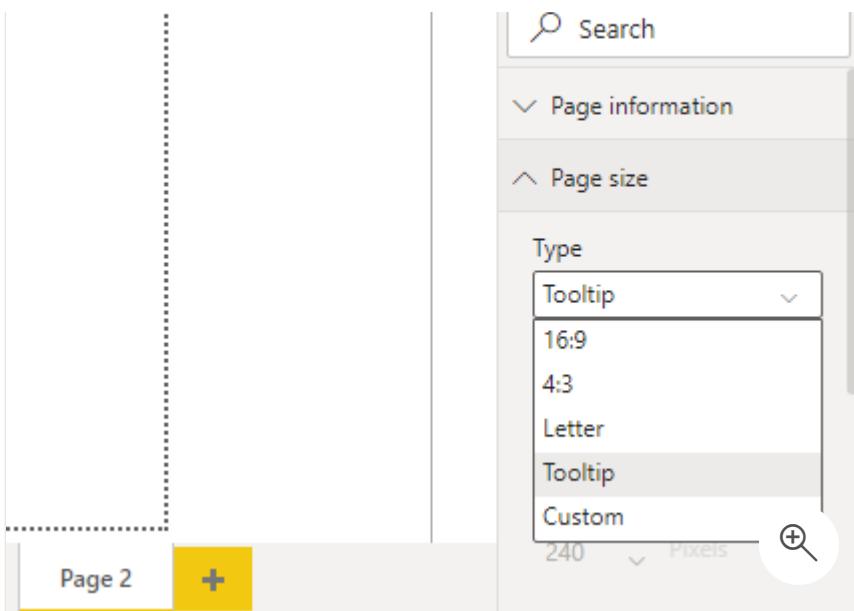




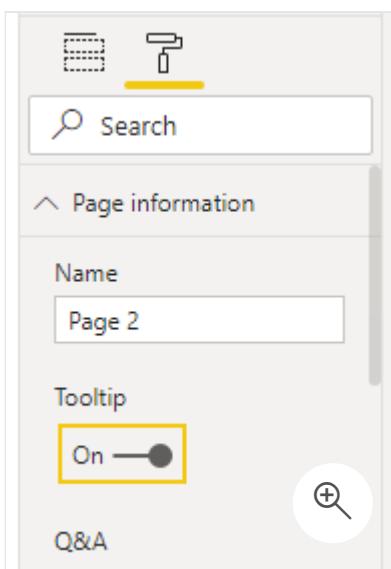
Another way to use tooltips is to display graphical information. The process of adding this type of tooltip is not as straightforward, but it is worthwhile. You would begin by creating a new page in the report.

Open the new page and then open the **Format** pane. Expand the **Page Size** section and then select **Tooltip** from the **Type** list.

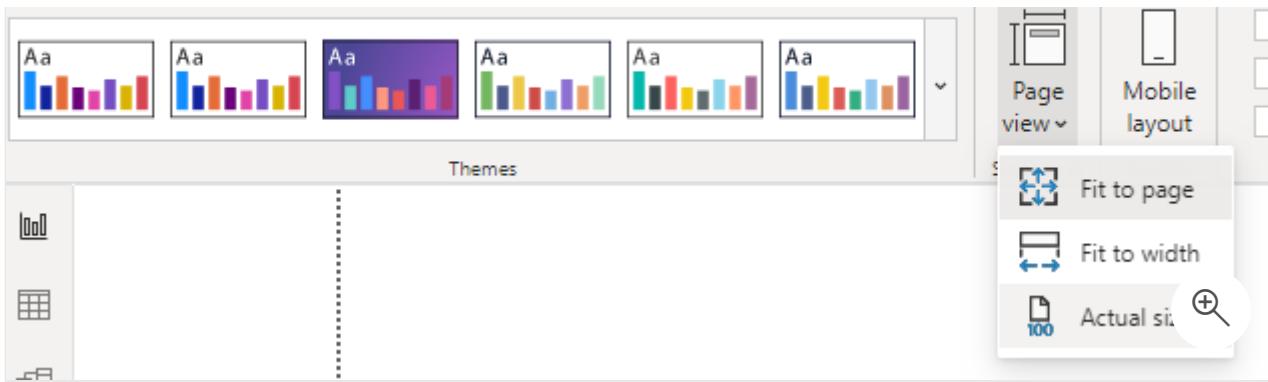




In the **Page information** section, turn the **Tooltip** slider to **On** so that Power BI registers this page as a tooltip page

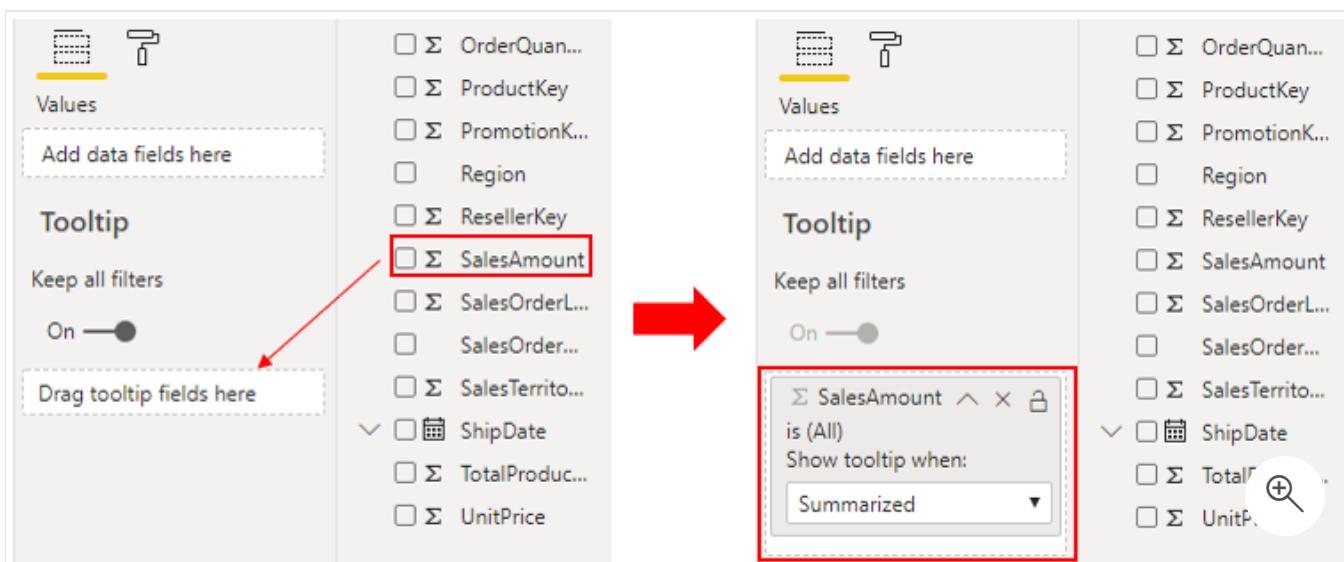


Tooltips have limited canvas space, so to ensure that your visuals appear in the tooltip, on the **View** tab, set the **Page view** option to **Actual size**.



Next, add one or more visuals to the tooltip page, in the same way that you would on any other report page.

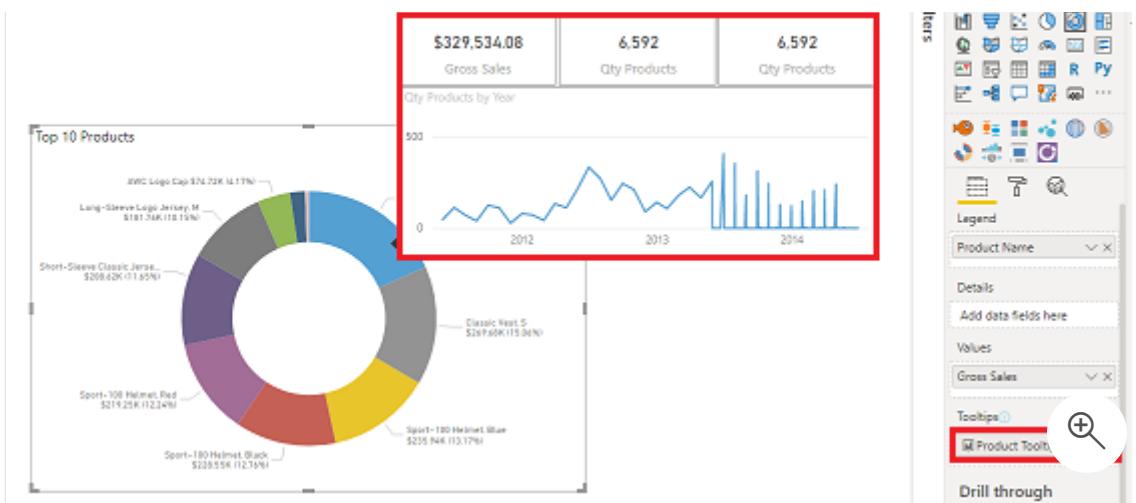
Now, you need to specify the fields for which you want the tooltip to display. Select the tooltip page and then select the **Values** tab in the **Visualizations** pane. Drag the fields from the **Fields** pane into the **Tooltip** bucket. In this example, you will drag the **SalesAmount** field into the **Tooltip** bucket.



Return to the report page and apply the tooltip to one or more visuals on that page. Select a visual and then, in the **Format** pane, scroll down to the **Tooltip** section. Turn the tooltip option **On** and then select your tooltip page from the **Page** list.

When you hover over the visual, the tooltip will display.





Next unit: Work with key performance indicators

[Continue >](#)

How are we doing? ★ ★ ★ ★ ★

✓ 100 XP ➔

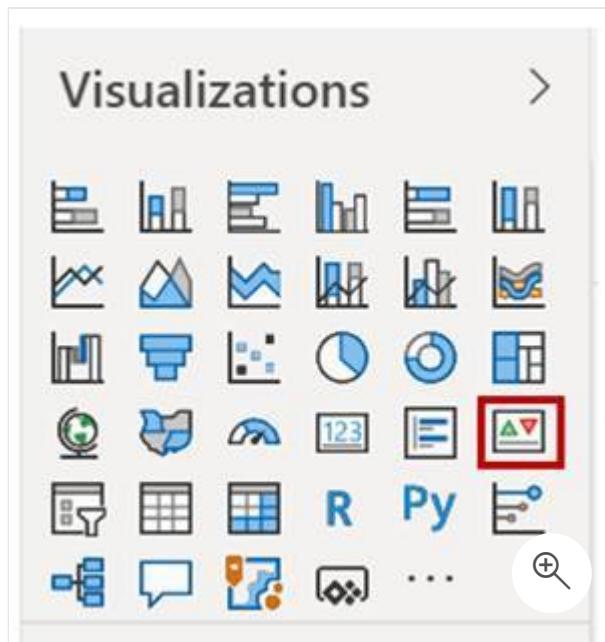
Work with key performance indicators

1 minute

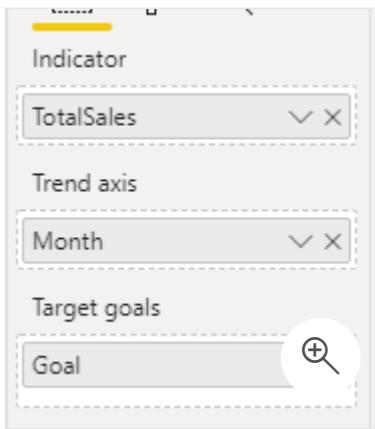
Key performance indicators (KPIs) are excellent in helping you track progress toward a specific goal over time. To use a KPI, you need three pieces of information:

- A unit of measurement that you want to track, for instance total sales, number of employee hires, number of loans serviced, or number of students enrolled.
- A goal for the measurement so that you can compare your progress with that goal.
- A time series, for instance daily, monthly, or yearly.

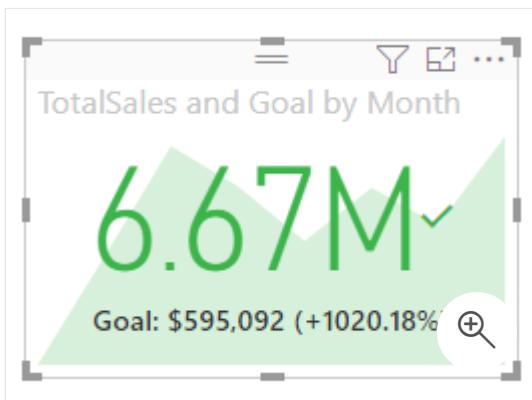
Start by adding the KPI visual to the design service. The following screenshot shows the KPI icon in the **Visualizations** pane.



When configuring the KPI visual, enter the unit of measurement that you are tracking in the **Indicator** prompt. Then, enter the goal under **Target goals** and select the time series from the **Trend axis** drop-down list, as shown in the following screenshot.



This action will produce a KPI that looks similar to the following screenshot.



KPIs work best in a series, for instance, showing the daily, monthly, and yearly goals in the section of a Power BI report.

TotalSales and Goal by Month



TotalSales and Goal by Fiscal Year



TotalUnits and Last Year Sales ...



Next unit: Exercise - Design a report in Power BI desktop

[Continue >](#)

How are we doing? ★ ★ ★ ★ ★

✓ 100 XP



Exercise - Design a report in Power BI desktop

45 minutes

This unit includes a lab to complete.

Use the free resources provided in the lab to complete the exercises in this unit. You will not be charged; however, you may need to bring your own subscription depending on the lab.

Microsoft provides this lab experience and related content for educational purposes. All presented information is owned by Microsoft and intended solely for learning about the covered products and services in this Microsoft Learn module.

[Launch lab](#)

Access your environment

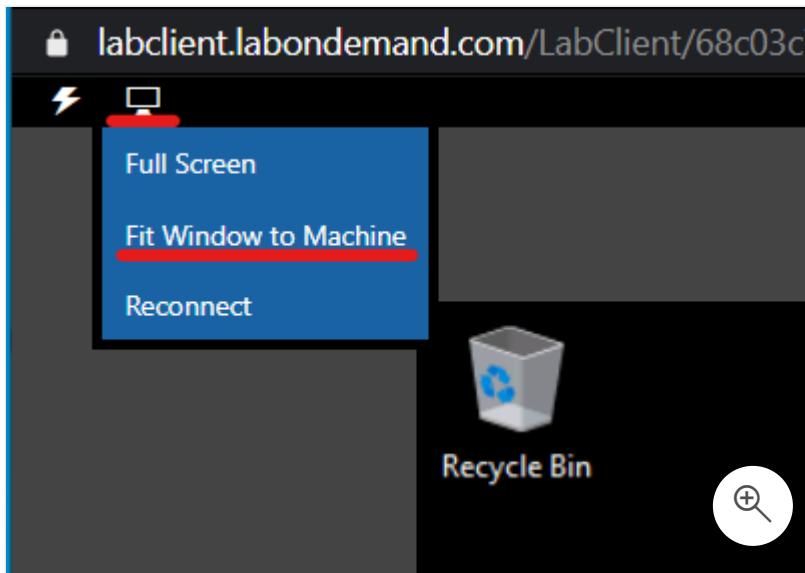
Before you start this lab (unless you are continuing from a previous lab), select **Launch lab** above.

You are automatically logged in to your lab environment as data-ai\student.

You can now begin your work on this lab.

Tip

To dock the lab environment so that it fills the window, select the PC icon at the top and then select **Fit Window to Machine**.



The estimated time to complete the exercise is 45 minutes.

! Note

A virtual machine containing the client tools you need is provided, along with the exercise instructions. Use the button above to launch the virtual machine.

A limited number of concurrent sessions are available - if the hosted environment is unavailable, try again later.

This exercise uses the Power BI service. You'll need to use your organizational account to login. If you don't have one or can't use yours, please create a free [M365 Developer account](#) to complete the exercise.

Alternatively, you can use these [setup instructions](#) to create your own lab environment, then follow these [exercise instructions](#).

Next unit: Check your knowledge

[Continue >](#)

How are we doing? ★ ★ ★ ★ ★

1. At the Contoso Skateboard Company, Brandon is designing a dashboard report to show inventory stock levels over time. What type of report visual should Brandon choose to effectively show the stock levels? *

Bar chart

Pie chart

Line chart

✓ A line chart is probably the most effective way to visualize a time series, such as stock inventory levels over time.

Scatter chart

2. At the Contoso Skateboard Company, Sakura is designing an analytical report. It must include a visual that allows report consumers to explore and discover detailed sales values over time and by store. What type of report visual should Sakura choose to support the report consumer requirement? *

Matrix

✓ A matrix visual allows the report consumer to drill down on the columns and rows to reveal detailed values.

Table

Treemap

✗ While a treemap visual supports drill down, it can't easily allow report consumers to explore and discover detailed values across multiple dimensions, like date and store.

Scatter chart

3. At the Contoso Skateboard Company, James is designing a dashboard report. It must prominently show values of sales revenue, units sold, cost of goods sold, and profit, and each value should be compared to a target value. What type of report visual should James choose to support the report consumer requirement? *

Card

KPI

✓ The answer is correct. A KPI visual can show and compare actual and target values.

- Ribbon chart
 - Stacked bar chart
-

Next unit: Summary

[Continue >](#)

How are we doing?     

Practice Assessment for Exam PL-300: Microsoft Power BI Data Analyst

Question 1 of 50

You plan to use Power BI Desktop to create a report with multiple visualizations.

You need to create a visual that supports the following:

- filters other visuals on the same report page
- allows users to search for values by which to filter the other visuals

Which type of visualization should you use?

Funnel

Matrix

Scatter chart

Slicer

✓ This answer is correct.

The slicer visualization can be used to filter the other visuals on the page. You can enable a search box in a slicer where users can search for values to filter. A funnel visualization is a chart that has sequential connected stages, where items flow sequentially from one stage to the next. A matrix visualization displays data in two or more dimensions and cross-highlights with other visuals on the same report page. A scatter chart visualization is a chart with one set of numerical data along a horizontal axis and another set of numerical values along a vertical axis. The matrix, scatter chart, and funnel do not offer a search box.

[Choose an effective visualization - Training | Microsoft Learn](#)

You plan to create a report in Power BI Desktop.

You need to create a visualization that displays data in two or more dimensions and cross-highlights with other visuals on the same report page.

Which type of visualization should you use?

Card

matrix

✓This answer is correct.

scatter

table

A matrix visualization displays data in two or more dimensions and cross-highlights with other visuals on the same report page. A card visualization displays a single data point. A scatter visualization is a chart, not a grid. It has two value axes, with one set of numerical data along a horizontal axis and another set of numerical values along a vertical axis. A table visualization is a grid that contains related data in a grid format, with support for two dimensions only.

[Choose an effective visualization - Training | Microsoft Learn](#)

[Next >](#)

[Check Your Answer](#)

You plan to create a report in Power BI Desktop.

You need to identify the type of visualization that displays data as a set of nested rectangles.

Which visualization should you use?

- bar chart
- column chart
- slicer
- treemap

✓ This answer is correct.

A treemap visualization displays data as a set of nested rectangles. A slicer visualization is available in different formats, including list, drop-down, and buttons, but not nested rectangles. A bar chart visualization presents data as horizontal bars. A column chart presents data as vertical columns.

[Choose an effective visualization - Training | Microsoft Learn](#)

[Next >](#)

[Check Your Answer](#)

Practice Assessment for Exam PL-300: Microsoft Power BI Data Analyst

Question 4 of 50

You need to create a custom R visual by using Power BI Desktop.

What do you need to do first?

- Configure global R scripting options in Power BI Desktop.
- Enable preview features in Power BI Desktop.
- Enable the script visuals option in the Visualization pane of Power BI Desktop.
- Install R on your computer.

✓ This answer is correct.

To create a custom R visual by using Power BI Desktop, you first need to install R on your computer. Configuring global R scripting options in Power BI Desktop might be required once you install R on your computer. Enabling the script visuals option in the Visualization pane of Power BI Desktop is done once R is installed and configured using the global R script options in Power BI Desktop. Creating a custom R visual by using Power BI Desktop has no dependency on enabling preview features.

[Add an R or Python visual - Training | Microsoft Learn](#)

Next >

[Check Your Answer](#)

Practice Assessment for Exam PL-300: Microsoft Power BI Data Analyst

Question 6 of 50

You need to create a visual that displays sales by employees, trending over months.

The visual must clearly show how employees are performing against each other and have a ranking for each period.

Which visual should you use?

clustered bar chart

ribbon chart

✓**This answer is correct.**

scatterplot

treemap

A ribbon chart places the highest (ranked) value at the top of the stacked column each month and shows those ranked changes over time. A treemap is not meant for displaying changes over time and wouldn't easily show ranked comparisons between employees. The clustered bar chart can be used to show changes over time, and a clustered bar chart will show comparisons between employees, but no ranking data is provided between employees. A scatterplot is typically used to compare a relationship between two (or more) calculations and their categorical distribution between each other.

[Choose an effective visualization - Training | Microsoft Learn](#)

[Use ribbon charts in Power BI - Power BI | Microsoft Learn](#)

Practice Assessment for Exam PL-300: Microsoft Power BI Data Analyst

Question 2 of 50

You plan to create a report in Power BI Desktop.

You need to identify the type of visualization that displays data as a set of nested rectangles.

Which visualization should you use?

- bar chart
- column chart
- slicer
- treemap

✓This answer is correct.

A treemap visualization displays data as a set of nested rectangles. A slicer visualization is available in different formats, including list, drop-down, and buttons, but not nested rectangles. A bar chart visualization presents data as horizontal bars. A column chart presents data as vertical columns.

[Choose an effective visualization - Training | Microsoft Learn](#)

[Next >](#)

[Check Your Answer](#)

Practice Assessment for Exam PL-300: Microsoft Power BI Data Analyst

Question 3 of 50

You plan to create a report in Power BI Desktop that will display sales opportunities by five sales stages, including lead, prospect, qualified, committed, and transacted.

You need to identify the type of visualization that will display a linear process with sequentially connected stages, with one stage transitioning to the next.

Which visualization should you use?

funnel

✓ This answer is correct.

slicer

treemap

waterfall

A funnel visualization displays a linear process with sequentially connected stages, with one stage transitioning to the next. A slicer visualization is available in different formats, including list, drop-down, and buttons, but not sequentially connected stages, with one stage transitioning to the next. A treemap visualization displays data as a set of nested rectangles. A waterfall visualization displays a running total as values are added or subtracted.

[Choose an effective visualization - Training | Microsoft Learn](#)

Next >

[Check Your Answer](#)

Practice Assessment for Exam PL-300: Microsoft Power BI Data Analyst

Question 4 of 50

You need to create a custom Python visual by using Power BI Desktop.

What do you need to do first?

- Configure global Python scripting options in Power BI Desktop.
- Enable preview features in Power BI Desktop.
- Enable the script visuals option in the Visualization pane of Power BI Desktop.
- ✓ **This answer is correct.**

 Install Python on your computer.

Enabling the script visuals option in the Visualization pane of Power BI Desktop is required before creating custom Python visuals in Power BI Desktop. Installing Python is not required. Configuring global Python scripting options in Power BI Desktop is not required to create Python visuals. The ability to create a custom Python visual by using Power BI Desktop has no dependency on enabling preview features.

[Add an R or Python visual - Training | Microsoft Learn](#)

Next >

[Check Your Answer](#)